# Appendix

## Government by Algorithm: Artificial Intelligence in Federal Administrative Agencies

This Appendix describes the variables and underlying data used in the empirical presentation ("Taking Inventory: A Survey of Federal Agency Use of AI") of *Government by Algorithm: Artificial Intelligence in Federal Administrative Agencies*, a report prepared for the Administrative Conference of the United States.

Part I sets forth the variable used to code AI use cases. Part II describes agency metadata and attributes. Part III lists all use cases reported in the report's empirical presentation.

## Part I. Use Case Coding Protocol

The following fields were used to document each use case captured by the search protocol.

**Governance Task**
Which of the following governance tasks best describes the objective of the AI/ML tool?

- **Enforcement**: tools that primarily identify or prioritize targets of agency enforcement action, including monitoring for violations that can lead to enforcement action
- **Regulatory research, analysis, and monitoring**: tools that collect or analyze information that shapes agency policymaking, or research intended to produce data or analysis for that purpose
- **Adjudication**: tools that support formal or informal agency adjudication of benefits or rights
- **Public services and engagement**: tools that support the direct provision of services to the public or facilitate communication with the public for regulatory or other purposes
- **Internal management**: tools that support agency management of resources, including employee management, procurement, and maintenance of technology systems

**Task Description**
A use-case specific description of the task in the context of the agency and its aim.

**Method**
Which of the following technical methods best describes the tool's use of artificial intelligence?

- Classification
- Regression
- Structured Prediction
- Clustering
- Dimensionality Reduction
- Robotics
- N/A

**Method Description**
A use-case specific description further clarifying technical specifications of the tool.

**Data Type**
Which of the following data types are used by the tool?

- Structured
  - 'Structured' data includes numerical information and other factored variables.
- Text
- Images
- Audio

**Data Description**
A use-case description of the data in the context of the particular algorithm.

**Implementation Stage**
Of the following options, how far along is the development of the tool?

- Planning: The agency or one of its representatives has expressed interest in or has committed to utilizing AI/ML for the given use case but it has not yet been piloted or deployed
- Piloting or Partially Deployed: The AI/ML tool is currently being tested or is partially in use
- Fully deployed: The AI/ML tool is currently fully deployed by the agency for the particular use case

**Developer**
Of the following options which entity was responsible for the technical development of the AI/ML tool?

- In-house: Government-employed developers were responsible for creating the tool.
- Commercial Contractor: Developers employed by a private business entity were responsible for creating the tool through a contract with the government.
- Non-Commercial Collaboration: The agency used a non-traditional means of procurement such as crowdsourcing, public-facing prize competitions, or academic-agency partnerships in order to develop the tool.

**Sophistication**
How technologically sophisticated is the tool? Note that sophistication is particularly difficult to judge, as it is dependent on the state of the science within a subfield. Unless some detail was provided, we did not make judgments solely based on the task. We attempted to evaluate scientific papers referenced by use cases, but there was a limit to our capacity to go beyond the agency materials.

- Higher: The model relies on a highly sophisticated technological method and/or data pipeline. For example, a deep neural network to predict intrinsic factors (sex, population affiliation, etc.) and extrinsic factors (human development and Gini indices) as indicators of life quality and social inequality, respectively.
- Medium: The model relies on a moderately sophisticated technological method and/or data pipeline. For example, a chatbot that provides information and login support and performs searches for visitors at the Federal Help Desk.
- Lower: The model relies on an unsophisticated technological method and/or data pipeline. For example, simple regression-based approaches to generate and predict quality-adjusted prices and price indices.
- Insufficient detail: Sources are unclear on the sophistication of the model or the model has yet to be developed.

**Citation**
A citation to the document referring to the agency use case, including a one or more links to the webpage(s) on which the use case was found.

# Part II. Agency Metadata and Attributes

**Number of Full Times Employees**

The number of individuals employed in a full-time capacity at the agency, as of September 2016. Source: Office of Personnel Management, Central Personnel Data File (September 2016), https://www.fedscope.opm.gov/employment_access.asp. Where the Office of Personnel Management did not track the number of employees, we consulted the Office of Management and Budget's Budget of the U.S. Government, Fiscal Year 2018, https://www.govinfo.gov/features/budget-fy2018, and the ASUC Sourcebook of United States Executive Agencies (Second Edition 2018), https://www.acus.gov/research-projects/sourcebook-united-states-executive-agencies-second-edition.

**Policy Area**

Which of the following options best describes the policy domain most related to the agency's function and mandate?

- Technology
- Transportation
- Workplace
- Internal management
- Law Enforcement
- Social Welfare
- Environmental Energy
- Financial Consumer
- Other

# Part III. Listing of Canvass Use Cases

## BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM

### Use Case #1

**Agency:** Board of Governors of the Federal Reserve System

**Subagency:** Consumer Financial Protection Bureau

**Policy Area:** Consumer Protection, Financial Regulation

**Task:** Regulatory research, analysis, and monitoring, Public services and engagement

**Task Description:** To categorize narratives, identify trends, and predict consumer harm in textual consumer complaints.

**Method:** Data Unavailable

**Data Type:** Text

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Consumer Financial Protection Bureau, Strategic Plan, Budget, and Performance Plan and Report (March 2014), https://files.consumerfinance.gov/f/strategic-plan-budget-and-performance-plan-and-report-FY2013-15.pdf (noting, at page 46, use of "natural language processing" for CFPB's Consumer Response System)

### Use Case #2

**Agency:** Board of Governors of the Federal Reserve System

**Subagency:** N/A

**Policy Area:** Other

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To predict the vulnerability of banks of different sizes to losses in various asset classes.

**Method:** Regression

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Lower

**Citation:** Board of Governors of the Federal Reserve, Dodd-Frank Act Stress Test 2017: Supervisory Stress Test Methodology and Results (June 2017), https://www.federalreserve.gov/publications/files/2017-dfast-methodology-results-20170622.pdf (noting, at page 14, that "The Federal Reserve's operational risk model forecasts losses using an average of estimates from two models—a historical simulation model, which remains unchanged, and a regression-based model, which relates operational risk to economic conditions.")

### Use Case #3

**Agency:** Board of Governors of the Federal Reserve System

**Subagency:** N/A

**Policy Area:** Other

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To assess bank risk using statistical and regulatory tools.

**Method:** Regression

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Lower

**Citation:** Board of Governors of the Federal Reserve System, Logit Model of Bank Failure (June 2011), https://www.gao.gov/new.items/d11612.pdf (noting at page 56, development of "a logistic (logit) regression model of bank failure prediction.")

### Use Case #4

**Agency:** Board of Governors of the Federal Reserve System

**Subagency:** N/A

**Policy Area:** Other

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To predict unemployment figures using neural networks.

**Method:** Regression

**Data Type:** Structured

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Higher

**Citation:** Thomas R. Cook & Aaron Smalter Hall, Macroeconomic Indicator Forecasting with Deep Neural

Networks (Sept. 2017), https://www.kansascityfed.org/publications/research/rwp/articles/2017/macroeconomic-indicator-forecasting-deep-neural-networks (noting use of neural nets)

### Use Case #5

**Agency:** Board of Governors of the Federal Reserve System

**Subagency:** N/A

**Policy Area:** Other

**Task:** Enforcement, Regulatory research, analysis, and monitoring

**Task Description:** To examine bank emails to identify signs of control failures or misbehavior.

**Method:** Data Unavailable

**Data Type:** Text

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Board of Governors of the Federal Reserve System, 2018 Financial Markets Conference—Keynote: A Conversation on Machine Learning in Financial Regulation (2018), https://www.frbatlanta.org/news/conferences-and-events/conferences/2018/0506-financial-markets-conference/transcripts/keynotes/quarles-conversation-machine-learning.aspx (noting the "use [of] some natural-language processing tools as part of the supervisory relationship with large institutions looking through emails and so forth to reveal certain relationships.")

## COMMODITY FUTURES TRADING COMMISSION

### Use Case #6

**Agency:** Commodity Futures Trading Commission

**Subagency:** N/A

**Policy Area:** Financial Regulation

**Task:** Enforcement, Regulatory research, analysis, and monitoring

**Task Description:** To facilitate surveillance and monitoring, customer identification, and anti-money laundering compliance, regulatory intelligence, reporting and risk management and investor risk assessment.

**Method:** Data Unavailable

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** J. Christopher Giancarlo, Chairperson, CFTC, Quantitative Regulation: Effective Market Regulation in a Digital Era, https://www.cftc.gov/PressRoom/SpeechesTestimony/opagiancarlo59 (noting series of CFTC initiatives to develop "automated data analysis," "machine learning," and "artificial intelligence" to work of the Division of Enforcement, the whistleblower program, and other forms of "enforcement analysis" as well as rulemaking).

## DEPARTMENT OF AGRICULTURE

### Use Case #7

**Agency:** Department of Agriculture

**Subagency:** Agricultural Research Service

**Policy Area:** Agriculture

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To research diseases and pests using genomics and proteomics as well as develop genetic stock resistant to these diseases using bioinformatics, machine learning and modeling.

**Method:** Data Unavailable

**Data Type:** Structured

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Insufficient detail

**Citation:** U.S. Department of Agriculture, High Performance Computing Related to Agricultural Research in Regard to Big Data, Geospatial Statistics, and Bioinformatics (undated but listed as active), https://www.ars.usda.gov/research/project/?accnNo=435529 (noting use of machine learning)

### Use Case #8

**Agency:** Department of Agriculture

**Subagency:** Food and Nutrition Service

**Policy Area:** Agriculture

**Task:** Enforcement

**Task Description:** To predict and model SNAP recipients' behavior to in order to identify fraud and suspicious activity

**Method:** Data Unavailable

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Agriculture Food and Nutrition Service, SAS® Analytics Helps US Food and Nutrition Service Bust Benefits Fraud (Aug. 2015), https://insidebigdata.com/2015/08/04/sas-analytics-helps-us-food-and-nutrition-service-bust-benefits-fraud/ (noting use of "statistical algorithms and machine-learning techniques")

## Use Case #9

**Agency:** Department of Agriculture

**Subagency:** Food Safety and Inspection Service

**Policy Area:** Agriculture

**Task:** Regulatory research, analysis, and monitoring, Public services and engagement

**Task Description:** To process genomic information in order to better identify the precise source of food pathogens.

**Method:** Data Unavailable

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Food Safety and Inspection Service, Use of Whole Genome Sequence (WGS) Analysis to Improve Food Safety and Public Health (Oct 2017), https://www.fsis.usda.gov/wps/wcm/connect/f88be6d2-a051-40a9-a787-5e4b180efa12/Transcript-Whole-Genome-Sequencing-102617.pdf?MOD=AJPERES (referencing use of machine learning methods)

## Use Case #10

**Agency:** Department of Agriculture

**Subagency:** Food Safety and Inspection Service

**Policy Area:** Agriculture

**Task:** Regulatory research, analysis, and monitoring, Public services and engagement

**Task Description:** To analyze food safety related questions from consumers, the food production industry, and the agency's inspection staff to identify trends.

**Method:** Classification

**Data Type:** Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** Adrianna Steers-Smith, Using Supervised Machine Learning to Classify Customer Input (July 20, 2019), https://ww2.amstat.org/meetings/jsm/2019/onlineprogram/AbstractDetails.cfm?abstractid=307713 (noting use of neural network and natural language processing)

## Use Case #11

**Agency:** Department of Agriculture

**Subagency:** Natural Resources Conservation Service

**Policy Area:** Agriculture

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To help landowners and natural resource managers track vegetation through time and plan actions to improve America's grazing lands. To inform strategies that improve productivity of grazing lands, manage weeds, mitigate impacts of wildfire and drought, and benefit wildlife habitats"

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** Department of Agriculture's Natural Resources Conservation Service, Rangeland Analysis Platform (Aug. 2017), https://rangelands.app/about/rapFactSheet.pdf (noting, at page 1, merger of "machine learning and cloud-based computing with remote sensing and field data")

## Use Case #12

**Agency:** Department of Agriculture

**Subagency:** Natural Resources Conservation Service

**Policy Area:** Agriculture

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To forecast the volume of daily water supply in a city or zip code as well as the likelihood that the volume will exceed the average daily supply.

**Method:** Regression

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Lower

**Citation:** Thomas C. Pagano, et al., Daily Updating of Operational Statistical Seasonal Water Supply Forecasts for the Western U.S., J. of AM. Water Resources Assoc. (2009), https://www.wcc.nrcs.usda.gov/ftpref/downloads/factpub/wsf/Pagano_et_al_Daily_WSF_JAWRA_2009.pdf (noting use of "Z-score regression")

## DEPARTMENT OF COMMERCE

### Use Case #13

**Agency:** Department of Commerce

**Subagency:** Bureau of Economic Analysis

**Policy Area:** Commerce

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To improve timing and accuracy of earlier information on economic indicators.

**Method:** Data Unavailable

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** Bureau of Economic Analysis, Machine learning for National Economic Accounts (2018), https://www.bea.gov/system/files/2018-11/2018-11-06-JeffChen-ACM-nn-wide.pptx (noting that to predict national economic accounts, a battery of machine learning methods were used including: "Principal Components Regression, LASSO, Ridge Regression, Gradient Boosting, Adaptive Boosting, and Random Forests")

### Use Case #14

**Agency:** Department of Commerce

**Subagency:** National Oceanic and Atmospheric Administration

**Policy Area:** Commerce

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To generate automated probabilistic forecasts for thunderstorm hazards.

**Method:** Regression

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** NOAA/CIMSS ProbSevere, Training Module (Spring 2019), https://cimss.ssec.wisc.edu/severe_conv/training/training.html (detailing NOAA development of "Naive Bayesian Classifier" model to predict thunderstorm hazards).

### Use Case #15

**Agency:** Department of Commerce

**Subagency:** National Oceanic and Atmospheric Administration

**Policy Area:** Commerce

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To identify whale songs.

**Method:** Classification

**Data Type:** Audio

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Higher

**Citation:** Ann Allen, OK Google: Find the Humpback Whales, NOAA Science Blog (Oct. 29, 2018), https://www.fisheries.noaa.gov/science-blog/ok-google-find-humpback-whales (describing use of neural net to identify whale songs); Matt Harvey, Acoustic Detection of Humpback Whales Using a Convolutional Neural Network, Google AI Blog (Oct. 29, 2018), https://ai.googleblog.com/2018/10/acoustic-detection-of-humpback-whales.html (same).

### Use Case #16

**Agency:** Department of Commerce

**Subagency:** National Oceanic and Atmospheric Administration

**Policy Area:** Commerce

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To create automated analysis pipelines for processing of marine video data.

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Higher

**Citation:** Emerging Technologies for NOAA Ocean Research, Operations and Management in the Ecosystem Context, Response from NOAA to a Report from the NOAA Science Advisory Board (Apr. 2018), ftp://ftp.oar.noaa.gov/SAB/sab/Meetings/2018/April/EmergingTecnologies_Response_SAB_30April2018.pdf (noting, at page 20, that "VIAME leverages developments in machine learning from the human surveillance and biomedical fields, as well as deep learning research funded through DARPA, to create automated analysis pipelines for processing of marine video data")

## Use Case #17

**Agency:** Department of Commerce

**Subagency:** National Oceanic and Atmospheric Administration

**Policy Area:** Commerce

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To predict habitat suitability for several taxa of deep-sea corals.

**Method:** Regression

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Higher

**Citation:** U.S. National Oceanic and Atmospheric Administration (NOAA), U.S. Deep-Sea Coral Layers--Antipatharia (Aug. 30, 2018), https://koordinates.com/layer/20540-us-deep-sea-coral-layers-antipatharia/ (noting use of "maximum entropy" machine learning algorithm).

## Use Case #18

**Agency:** Department of Commerce

**Subagency:** United States Patent and Trademark Office

**Policy Area:** Commerce

**Task:** Adjudication

**Task Description:** To search whole documents against a corpus of documents to identify prior art.

**Method:** Classification

**Data Type:** Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Higher

**Citation:** Arthi Krishna et al., Examiner Assisted Automated Patents Search, AAAI Fall Symp. Series: Cognitive Assistance in Gov't & Pub. Sector Applications 153 (2016), https://www.aaai.org/ocs/index.php/FSS/FSS16/paper/view/14096/13682 (detailing use of search algorithms and natural language processing); U.S. Patent and Trademark Office, Emerging Technologies in USPTO Business Solutions (May 25, 2018), https://www.wipo.int/edocs/mdocs/globalinfra/en/wipo_ip_itai_ge_18/wipo_ip_itai_ge_18_p5.pdf (same)

## Use Case #19

**Agency:** Department of Commerce

**Subagency:** United States Patent and Trademark Office

**Policy Area:** Commerce

**Task:** Adjudication

**Task Description:** To generate patent term synonyms.

**Method:** Classification

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** United States Patent and Trademark Office, Emerging Technologies in USPTO Business Solutions (May 2018), https://www.wipo.int/edocs/mdocs/globalinfra/en/wipo_ip_itai_ge_18/wipo_ip_itai_ge_18_p5.pdf (noting, at slide 16, an AI Patent Term Generator and on slide 18 a Patent Synonyms Generator Tool); Andrei Iancu, Director, U.S. Patent & Trademark Office, Remarks by Director Iancu at 2018 National Lawyers Convention (Nov. 2018), https://www.uspto.gov/about-us/news-updates/remarks-director-iancu-2018-national-lawyers-convention (noting the use of "semi-automated tools for 'search query expansion,' trained to mine technology-specific synonyms with the help of crowd- or 'examiner-sourcing'" )

## Use Case #20

**Agency:** Department of Commerce

**Subagency:** United States Patent and Trademark Office

**Policy Area:** Commerce

**Task:** Adjudication

**Task Description:** To create a chatbot accompanying the

USPTO Manual Patent of Examination of Procedures (MPEP) for claim and classification analytics.

**Method:** Structured Prediction

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Higher

**Citation:** United States Patent and Trademark Office, Emerging Technologies in USPTO Business Solutions (May 2018), https://www.wipo.int/edocs/mdocs/globalinfra/en/wipo_ip_itai_ge_18/wipo_ip_itai_ge_18_p5.pdf (noting, at slide 16, the possibility of Deep Machine Learning Chat Bots, with a prototype service on slide 22)

### Use Case #21

**Agency:** Department of Commerce

**Subagency:** United States Patent and Trademark Office

**Policy Area:** Commerce

**Task:** Adjudication

**Task Description:** To classify patent applications for claim processing

**Method:** Classification

**Data Type:** Text

**Implementation Stage:** Fully deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Artificial Intelligence: Challenges Presented by Patents, Serco Blog (Dec. 26, 2018), https://sercopatentsearch.com/post?name=artificial-intelligence-challenges-presented-by-patents (noting collaboration with PTO applying AI tools to classification tasks)

### Use Case #22

**Agency:** Department of Commerce

**Subagency:** United States Patent and Trademark Office

**Policy Area:** Commerce

**Task:** Adjudication

**Task Description:** To classify trademark applications and assign design codes for processing

**Method:** Classification

**Data Type:** Structured, Images

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Higher

**Citation:** United States Patent and Trademark Office, Emerging Technologies in USPTO Business Solutions (May 2018), https://www.wipo.int/edocs/mdocs/globalinfra/en/wipo_ip_itai_ge_18/wipo_ip_itai_ge_18_p5.pdf (noting, at slide 14, use of "deep learning" for trademark design code suggestions)

### Use Case #23

**Agency:** Department of Commerce

**Subagency:** United States Patent and Trademark Office

**Policy Area:** Commerce

**Task:** Adjudication

**Task Description:** To assist search for existing trademark images

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Higher

**Citation:** United States Patent and Trademark Office, Emerging Technologies in USPTO Business Solutions (May 2018), https://www.wipo.int/edocs/mdocs/globalinfra/en/wipo_ip_itai_ge_18/wipo_ip_itai_ge_18_p5.pdf (noting, at slides 19-20, use of "neural networks" for image search)

## DEPARTMENT OF EDUCATION

### Use Case #24

**Agency:** Department of Education

**Subagency:** N/A

**Policy Area:** Education

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To score written portions of K-12 student assessments

**Method:** Data Unavailable

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Education, Race to the Top Assessment Public Meeting on Assessment Program and Technical Assistance Public Meeting (June 2011), https://www2.ed.gov/programs/racetothetop-assessment/june-10-2011-transcript.pdf (noting use of machine learning and natural language processing in agency effort to "expand the knowledge and expertise of the Department of Education" regarding AI-powered educational assessments)

## DEPARTMENT OF ENERGY

### Use Case #25

**Agency:** Department of Energy

**Subagency:** Federal Energy Regulatory Commission

**Policy Area:** Energy

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To monitor infrastructure projects and predict project schedules and costs.

**Method:** Data Unavailable

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Press Release, LawIQ Wins Contract to Provide Regulatory Analytics to FERC (Feb. 27, 2018), https://www.prnewswire.com/news-releases/lawiq-wins-contract-to-provide-regulatory-analytics-to-ferc-300605067.html (noting FERC contract for software that uses "a machine learning technology that continuously analyzes hundreds of variables impacting project schedules and costs")

## DEPARTMENT OF HEALTH AND HUMAN SERVICES

### Use Case #26

**Agency:** Department of Health and Human Services

**Subagency:** Centers for Disease Control and Prevention

**Policy Area:** Health

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To classify whether a child has autism based on medical records

**Method:** Classification

**Data Type:** Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** HHS, Rapid Autism Classification for Public Health, https://www.hhs.gov/cto/projects/rapid-autism-classification-for-public-health/index.html (noting CDC project applying multiple machine learning techniques, including natural language processing and convolutional neural networks to predicting autism)

### Use Case #27

**Agency:** Department of Health and Human Services

**Subagency:** Centers for Disease Control and Prevention

**Policy Area:** Health

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To de-duplicate patient immunization records

**Method:** Classification

**Data Type:** Structured

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Centers for Disease Control and Prevention, Immunization Information Systems: Patient-Level De-Duplication Best Practices (June 25, 2013), https://www.cdc.gov/vaccines/programs/iis/interop-proj/downloads/de-duplication.pdf (noting multiple machine learning techniques).

### Use Case #28

**Agency:** Department of Health and Human Services

**Subagency:** Centers for Medicare and Medicaid Services

**Policy Area:** Health

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To analyze Medicare program performance metrics (e.g., hospital readmissions).

**Method:** Regression

**Data Type:** Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Centers for Medicare and Medicaid Services, Leveraging the Big-Data Revolution: CMS Is Expanding Capabilities To Spur Health System Transformation (July 2014), https://www.healthaffairs.org/doi/full/10.1377/hlthaff.2014.0130 (noting the initiative's use of big data for the "predictive modeling of the risk of future health care expenditures")

## Use Case #29

**Agency:** Department of Health and Human Services

**Subagency:** Centers for Medicare and Medicaid Services

**Policy Area:** Health

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To predict unplanned hospital admissions and adverse events.

**Method:** Data Unavailable

**Data Type:** Structured, Text

**Implementation Stage:** Planning

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Insufficient detail

**Citation:** Centers for Medicare and Medicaid Services, Artificial Intelligence (AI) Health Outcomes Challenge (2019), https://innovation.cms.gov/initiatives/artificial-intelligence-health-outcomes-challenge/ (noting use of deep learning and neural networks).

## Use Case #30

**Agency:** Department of Health and Human Services

**Subagency:** Centers for Medicare and Medicaid Services

**Policy Area:** Health

**Task:** Enforcement

**Task Description:** To identify, at the time of claim submission, when mistakes or intentional behavior may lead to improper payments or indicate fraud, in the Medicare Fee-for-Service Program.

**Method:** Data Unavailable

**Data Type:** Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Seema Verma, The Future of Medicare Program Integrity, CMS Blog (Oct. 21, 2019), https://www.cms.gov/blog/future-medicare-program-integrity (noting agency development of "AI and machine learning tools"); Centers for Medicare & Medicaid Services, Request for Information on the Future of Program Integrity (undated), https://www.cms.gov/About-CMS/Components/CPI/Downloads/Center-for-Program-Integrity-Future-of-PI-RFI.pdf (same)

## Use Case #31

**Agency:** Department of Health and Human Services

**Subagency:** Food and Drug Administration

**Policy Area:** Health

**Task:** Internal management

**Task Description:** To receive Tier 0 and 1 requests for the FDA's Office of Computational Sciences and notify the help desk assistant to send access and installation keys to callers

**Method:** Structured Prediction

**Data Type:** Audio

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Higher

**Citation:** Food & Drug Administration, FDA's Virtual Assistant: Utilizing Machine Learning for Automated Customer Service, https://www.fda.gov/media/130558/download (noting FDA's partnership with IBM to automate customer service)

## Use Case #32

**Agency:** Department of Health and Human Services

**Subagency:** Food and Drug Administration

**Policy Area:** Health

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To make MedDRA coding decisions (e.g., adverse events of drugs and therapeutic biologic products) in submissions that include patient narratives

**Method:** Structured Prediction

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Food & Drug Administration, Impact Story: Capturing Patient Experience Through Deep Learning (Mar. 5, 2019),

https://www.fda.gov/drugs/regulatory-science-action/impact-story-capturing-patient-experience-through-deep-learning (noting use of "deep learning," including "neural networks," to extract MedDRA terms from documents for various agency purposes)

### Use Case #33

**Agency:** Department of Health and Human Services

**Subagency:** Food and Drug Administration

**Policy Area:** Health

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To scan external information (e.g., product complaints) to detect food contamination events and evaluate inspection and sampling findings to inform future policies.

**Method:** Data Unavailable

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Food & Drug Administration, Food for Thought: Ideas on How to Begin a New Era of Smarter Food Safety (undated), https://www.fda.gov/media/131682/download (noting use of artificial intelligence and predictive analytics)

### Use Case #34

**Agency:** Department of Health and Human Services

**Subagency:** Food and Drug Administration

**Policy Area:** Health

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To estimate time-to-event for pharmaceuticals effects.

**Method:** Regression

**Data Type:** Structured, Text

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** Xiajing Gong, Meng Hu, Liang Zhao, Big Data Toolsets to Pharmacometrics: Application of Machine Learning for Time- to- Event Analysis, 11 Clinical Translational Sci. 3 (2018), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5944589/#!po=5.00000 (noting use of machine learning methods)

### Use Case #35

**Agency:** Department of Health and Human Services

**Subagency:** Food and Drug Administration

**Policy Area:** Health

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To predict the time to first ANDA submissions referencing new chemical entities following their earliest lawful ANDA submission dates.

**Method:** Regression

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** Meng Hu et. al., Predictive Analysis of First Abbreviated New Drug Application Submission for New Chemical Entities Based on Machine Learning Methodology, 106 Clinical Pharmacology 1 (2019), https://ascpt-onlinelibrary-wiley-com.stanford.idm.oclc.org/doi/abs/10.1002/cpt.1479 (noting use of machine learning survival model)

### Use Case #36

**Agency:** Department of Health and Human Services

**Subagency:** Food and Drug Administration

**Policy Area:** Health

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To use sensory analysis to determine the decomposition status of seafood samples.

**Method:** Regression

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** Randy L. Self, Michael G. McLendon, Christopher M. Lock, Determination of Decomposition in Salmon Products by Mass Spectrometry with Sensory- driven Multivariate Analysis, 39 J. of Food Safety 5 (2019), https://onlinelibrary-wiley-com.stanford.idm.oclc.org/doi/full/10.1111/jfs.12676 (noting use of random forest machine learning model)

### Use Case #37

**Agency:** Department of Health and Human Services

**Subagency:** Food and Drug Administration

**Policy Area:** Health

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To detect filth elements in food contamination

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Higher

**Citation:** Leihong Wu et. al., A Deep Learning Model To Recognize Food Contaminating Beetle Species Based on Elytra Fragments, 166 Computers & Elec. in Agric. 105002 (2019), https://doi.org/10.1016/j.compag.2019.105002 (noting use of neural networks)

## Use Case #38

**Agency:** Department of Health and Human Services

**Subagency:** Food and Drug Administration

**Policy Area:** Health

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To identify adverse event reports that are likely to demonstrate medication-related causality.

**Method:** Regression

**Data Type:** Structured, Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** Lichy Han et al., Development of an Automated Assessment Tool for MedWatch Reports in the FDA Adverse Event Reporting System, 24 J. Am. Med. Informatics Assoc. 913 (2017), https://www.ncbi.nlm.nih.gov/pubmed/28371826 (noting use of natural language processing techniques)

## Use Case #39

**Agency:** Department of Health and Human Services

**Subagency:** Interagency

**Policy Area:** Health

**Task:** Internal management

**Task Description:** To create a multi-function AI project available to all agencies looking for AI solution; cut down workload of federal employees; integrate IAAI technologies to all phases of government operations

**Method:** Data Unavailable

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Aaron Boyd, The Intelligent Automation/Artificial Intelligence Contract Is Ready for HHS Buyers, Though Officials Have Plans to Grow the Business, Nextgov (May 31, 2019), https://www.nextgov.com/emerging-tech/2019/05/hhs-splits-49m-ai-automation-contract-evenly-between-small-large-businesses/157390/ (noting "machine learning, natural language processing")

## Use Case #40

**Agency:** Department of Health and Human Services

**Subagency:** Office of the CTO

**Policy Area:** Health

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To auto-categorize public comments to proposed regulations.

**Method:** Clustering

**Data Type:** Text

**Implementation Stage:** Fully deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Lower

**Citation:** Department of Health and Human Services, Increasing Efficiency in Rule Making with Natural Language Processing (undated), https://www.hhs.gov/cto/projects/increasing-efficiency-in-rule-making-with-natural-language-processing/index.html (noting use of natural language processing and the "Content Analyst Analytical Technology tool (CAAT)"); Content Analyst Company, LLC Defensibility of Content Analyst Analytical Technology (CAAT) for Use in Legal Proceedings (2009), https://www.iconect.com/wp-content/uploads/2013/09/CAAT-Defensibility-White-Paper.pdf (describing CAAT methods, including latent semantic indexing (LSI) using singular value decomposition (SVD)).

## Use Case #41

**Agency:** Department of Health and Human Services

**Subagency:** Substance Abuse and Mental Health Services Administration

**Policy Area:** Health

**Task:** Public services and engagement

**Task Description:** To deliver an intuitive interface that will improve health experiences and patient outcomes

**Method:** Data Unavailable

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Tiag, HHS Substance Abuse and Mental Health Services Administration Leverages tiag Expertise in Clinical Informatics, Behavioral Health and Artificial Intelligence (Sept. 6, 2017), http://tiag.net/wp-content/uploads/HHS-Substance-Abuse-and-Mental-Health-Services-Administration-Leverages-tiag-Expertise.pdf (noting use of natural language processing techniques in SAMHSA-contracted software).

## Use Case #42

**Agency:** Department of Health and Human Services

**Subagency:** N/A

**Policy Area:** Health

**Task:** Internal management

**Task Description:** To clean data from legacy systems to maximize visibility of contract terms across agency procurement process

**Method:** Classification

**Data Type:** Structured

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Health and Human Services, HHS blockchain-AI Project Gets Go-Ahead to Use Live Agency Acquisition Data (Dec 2018), https://federalnewsnetwork.com/blockchain/2018/12/hhs-blockchain-ai-project-gets-go-ahead-to-use-live-agency-acquisition-data/ (noting use of "[m]achine learning" to "cleanse[] the data as it comes in from our legacy systems").

## Use Case #43

**Agency:** Department of Health and Human Services

**Subagency:** N/A

**Policy Area:** Health

**Task:** Internal management

**Task Description:** To determine which grant applications are likely to be accepted or rejected, assign risk ratings and evaluate reports

**Method:** Classification

**Data Type:** Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Sara Friedman, Streamlining Grants Management with Machine Learning, https://gcn.com/articles/2018/06/28/analytics-grants-management-workflow.aspx (noting use of "predictive analytics and machine learning" to analyze grant quality); GCN, Turning to Machine Learning for Better ROI (Nov. 1, 2018), https://gcn.com/articles/2018/11/01/psi_intelligent-grants-automation.aspx (noting same tool's use of "a series of machine learning algorithms").

## Use Case #44

**Agency:** Department of Health and Human Services

**Subagency:** N/A

**Policy Area:** Health

**Task:** Internal management

**Task Description:** To improve procurement efficiency -- e.g., identifying duplicate procurements to realize economies of scale

**Method:** Structured Prediction

**Data Type:** Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Health and Human Services, The BuySmarter Journey: Our Successes Thus Far (Summer 2018), https://www.hhs.gov/sites/default/files/hhs-buysmarter-journey.pdf (noting, at page 9, use of natural language processing to put structure on agency procurement contracts for analysis)

## DEPARTMENT OF HOMELAND SECURITY

### Use Case #45

**Agency:** Department of Homeland Security

**Subagency:** Federal Emergency Management Agency

**Policy Area:** Law Enforcement

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To conduct flood modeling and analytics

**Method:** Classification, Structured Prediction

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Homeland Security, Flood Apex Program Overview (Sept. 7, 2017), https://www.fgdc.gov/ngac/meetings/september-2017/dhs-flood-apex-overview-ngac-sep-2017.pdf (noting, at slide 5, research to develop "[d]eep learning and artificial intelligence")

### Use Case #46

**Agency:** Department of Homeland Security

**Subagency:** Federal Emergency Management Agency

**Policy Area:** Law Enforcement

**Task:** Public services and engagement

**Task Description:** To assist first responders in disaster areas by using drones that map disaster-stricken areas.

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Nicole Ogrysko, DoD Sees AI's potential in Addressing Humanitarian, Disaster-Relief Challenges, Federal News Network (Oct. 24, 2018), https://federalnewsnetwork.com/artificial-intelligence/2018/10/dod-sees-ais-potential-in-addressing-humanitarian-disaster-relief-challenges/ (noting use of "AI" in connection with imagery); Ritwik Gupta et al., Creating xBD: A Dataset for Assessing Building Damage from Satellite Imagery, CVPR Workshop (2019), http://openaccess.thecvf.com/content_CVPRW_2019/papers/cv4gc/Gupta_Creating_xBD_A_Dataset_for_Assessing_Building_Damage_from_Satellite_CVPRW_2019_paper.pdf (detailing machine learning approach)

### Use Case #47

**Agency:** Department of Homeland Security

**Subagency:** Transportation Security Administration

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To automatically classify the contents of passenger Stream-of-Commerce images/data in a manner that can support future algorithm development for explosives and/or prohibited item threats.

**Method:** Data Unavailable

**Data Type:** Images

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Homeland Security Transportation Security Administration, News Release: DHS Awards $200K for AI-Based Object Recognition Proof-of-Concept (Nov 2019), https://www.dhs.gov/science-and-technology/news/2019/11/04/news-release-dhs-awards-200k-ai-based-proof-concept (noting funding to "develop a proof-of-concept for an artificial intelligence (AI)-based object recognition capability for the Transportation Security Administration")

### Use Case #48

**Agency:** Department of Homeland Security

**Subagency:** Transportation Security Administration

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To predict the probability that a given body zone (out of 17 total body zones) has a threat present.

**Method:** Regression

**Data Type:** Images

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Homeland Security, Transportation Security Administration, Passenger Screening Algorithm Challenge (2017), https://www.kaggle.com/c/passenger-screening-algorithm-challenge (noting in the competition description that "TSA is stepping outside their established procurement process and is challenging the broader data science community to help improve the accuracy of their threat prediction algorithms")

### Use Case #49

**Agency:** Department of Homeland Security

**Subagency:** Transportation Security Administration

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To replace manual photo identification with facial recognition

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Transportation Security Administration, Biometrics Roadmap For Aviation Security & the Passenger Experience (Sept. 2018), https://www.tsa.gov/sites/default/files/tsa_biometrics_roadmap.pdf (noting that "[f]acial recognition capabilities will be automated to improve the performance and security of TSA operations")

### Use Case #50

**Agency:** Department of Homeland Security

**Subagency:** United States Citizenship and Immigration Services

**Policy Area:** Law Enforcement

**Task:** Public services and engagement

**Task Description:** To provide assistance navigating the USCIS website and answering immigration questions.

**Method:** Structured Prediction

**Data Type:** Text

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** U.S. Citizenship and Immigrations Services, Emma: Friendly Presence and Innovative USCIS Resource--Available 24/7 (Sept. 1, 2016), https://www.uscis.gov/archive/blog/2016/09/emma-friendly-presence-and-innovative (noting that system called Emma "is not a live agent but an artificial intelligence conversational software")

### Use Case #51

**Agency:** Department of Homeland Security

**Subagency:** United States Customs and Border Protection

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To analyze and compare facial images from electronic passports – or e-Passports – to live captured images in order to identify imposters attempting to enter the United States.

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** United States Customs and Border Protection, Unisys Helps Customs and Border Protection Implement Facial Recognition System at JFK Airport (Jan 2016), https://www.unisys.com/offerings/security-solutions/News%20Release/Unisys-Helps-Customs-and-Border-Protection-Implement-Facial-Recognition-System-JFK (noting a use case "to efficiently and accurately perform one-to-one facial image comparisons")

### Use Case #52

**Agency:** Department of Homeland Security

**Subagency:** United States Customs and Border Protection

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To develop border facial recognition.

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** United States Customs and Border Protection, CBP to Implement a Facial Comparison Technical Demonstration at Anzalduas International Bridge for Vehicle Travelers (Aug 2018), https://www.cbp.gov/newsroom/local-media-release/cbp-implement-facial-comparison-technical-demonstration-anzalduas (noting CBP's use of "a facial comparison system comprised of a camera to test and evaluate capturing facial

biometrics of vehicle travelers entering and departing the United States and compare those images to photos on file in government holdings")

### Use Case #53

**Agency:** Department of Homeland Security

**Subagency:** United States Customs and Border Protection

**Policy Area:** Law Enforcement

**Task:** Enforcement, Regulatory research, analysis, and monitoring

**Task Description:** To create an open source platform that can receive and store standard air traveler information (Advanced Passenger Information (API) and Passenger Name Record (PNR)) enabling real-time risk-modeling.

**Method:** Regression

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Emerj, The Department of Homeland Security Uses AI-Enhanced Entity Resolution for Its Global Travel Assessment System (GTAS) (Dec. 12, 2018), https://emerj.com/ai-case-studies/the-department-of-homeland-security-uses-ai-enhanced-entity-resolution-for-its-global-travel-assessment-system-gtas/ (noting CBP collaboration with Tamr to use a "machine learning platform")

### Use Case #54

**Agency:** Department of Homeland Security

**Subagency:** United States Customs and Border Protection

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To identify travelers and cargo that present security risks.

**Method:** Data Unavailable

**Data Type:** Structured

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** U.S. Department of Homeland Security, 2017 Data Mining Report to Congress (Oct. 2018), https://www.dhs.gov/sites/default/files/publications/2017-dataminingreport_0.pdf (noting multiple uses of unspecified machine learning techniques)

### Use Case #55

**Agency:** Department of Homeland Security

**Subagency:** United States Immigration and Customs Enforcement

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To create a predictive risk assessment platform using social media

**Method:** Classification

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Chinmayi Sharma, The National Vetting Enteprise: Artificial Intelligence and Immigration Enforcement, Lawfare (Jan. 8, 2019), https://www.lawfareblog.com/national-vetting-enterprise-artificial-intelligence-and-immigration-enforcement (detailing ICE's piloting, but eventual rejection, of unspecified machine learning methods to perform "vetting" of immigrants, particularly regarding social media data)

### Use Case #56

**Agency:** Department of Homeland Security

**Subagency:** United States Secret Service

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To develop facial recognition at the White House complex.

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Homeland Security, DHS/USSS/PIA-024, Facial Recognition Pilot (Nov. 26, 2018), https://www.dhs.gov/publication/dhsussspia-024-facial-recognition-

pilot (describing, at page 2, Secret Service piloting of "facial recognition algorithms" to identify facial images among agency volunteers).

### Use Case #57

**Agency:** Department of Homeland Security

**Subagency:** N/A

**Policy Area:** Law Enforcement

**Task:** Internal management

**Task Description:** To deploy thousands of rules to instantly defend against complex DDoS attacks at very high speeds.

**Method:** Classification

**Data Type:** Structured

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** U.S. House of Representatives, Committee on Oversight and Government Reform, Game Changers: Artificial Intelligence Part II, Artificial Intelligence and the Federal Government (Mar. 7, 2018) (noting, at page 30, use of "machine learning" to counter distributive denial of service attacks)

### Use Case #58

**Agency:** Department of Homeland Security

**Subagency:** N/A

**Policy Area:** Law Enforcement

**Task:** Public services and engagement

**Task Description:** To gather and synthesize data for first responders

**Method:** Classification

**Data Type:** Audio

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Homeland Security, Snapshot: Public Safety Agencies Pilot Artificial Intelligence to Aid in First Response (Oct. 16, 2018), https://www.dhs.gov/science-and-technology/news/2018/10/16/snapshot-public-safety-agencies-pilot-artificial-intelligence (noting use of "neural symbolic processing" to achieve "better machine intelligence")

### Use Case #59

**Agency:** Department of Homeland Security

**Subagency:** N/A

**Policy Area:** Law Enforcement

**Task:** Public services and engagement, Internal management

**Task Description:** To provide TDoS (Telephony Denial of Service) protection: defend 911 centers against life-threatening distributed denial-of-service attacks, identify, categorize, and score adversarial telephony denial-of-service techniques.

**Method:** Classification

**Data Type:** Structured

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** U.S. House of Representatives, Committee on Oversight and Government Reform, Game Changers: Artificial Intelligence Part II, Artificial Intelligence and the Federal Government (Mar. 2018) (noting, at page 30, the use of a "machine learning-based policy engine" for TDOS protection)

## DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

### Use Case #60

**Agency:** Department of Housing and Urban Development

**Subagency:** Federal Housing Administration

**Policy Area:** Housing

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To assist with credit risk determination

**Method:** Classification

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Lower

**Citation:** Federal Housing Administration, Fiscal Year 2015 Annual Management Report (2015) https://www.hud.gov/sites/documents/FHAFY2015ANNUALMGMNTRPT1.PDF (scoring algorithm to measure credit risk and the probability of a loan "claiming")

### Use Case #61

**Agency:** Department of Housing and Urban Development

**Subagency:** N/A

**Policy Area:** Housing

**Task:** Public services and engagement

**Task Description:** To assist citizens looking for information about rental assistance, information about HUD programs, and procedures for sending discrimination complaints.

**Method:** Structured Prediction

**Data Type:** Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Medium

**Citation:** HUD Customer Service Bot (undated), https://hud-rental-assistance-bot.herokuapp.com/ (offering "test bot")

## DEPARTMENT OF HOMELAND SECURITY

### Use Case #62

**Agency:** Department of Homeland Security

**Subagency:** U.S. Coast Guard

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To assist the agency in determining which vessels might be violating safety and fishing laws.

**Method:** Classification

**Data Type:** Structured

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Medium

**Citation:** Hans Chalupsky, Estimating Violation Risk for Fisheries Regulations (2013), http://archive.dimacs.rutgers.edu/People/Staff/froberts/Roberts_FisheriesScoringRules7-12-13final8-4-13.pdf (noting use of boosted decision tree machine learning model)

## DEPARTMENT OF JUSTICE

### Use Case #63

**Agency:** Department of Justice

**Subagency:** Federal Bureau of Investigation

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To aid with biometrics (Iris and fingerprint matching), as well as facial recognition

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Federal Bureau of Investigation, Next Generation Identification (NGI), https://www.fbi.gov/services/cjis/fingerprints-and-other-biometrics/ngi (noting FBI system featuring a "new fingerprint matching algorithm")

### Use Case #64

**Agency:** Department of Justice

**Subagency:** Federal Bureau of Investigation

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To identify altered fingerprints

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Justice, FBI Seeks AI Solutions for Altered Fingerprint Detection (Aug. 2018), https://intelligencecommunitynews.com/fbi-seeks-ai-solutions-for-altered-fingerprint-detection/ (noting the need to develop "AI to enable the NGI System to detect and match not only the alteration types the algorithm has been coded to detect and match, but also new alteration types the algorithm has not previously received")

## Use Case #65

**Agency:** Department of Justice

**Subagency:** Federal Bureau of Investigation

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To identify terrorist financing

**Method:** Data Unavailable

**Data Type:** Structured, Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Federal Bureau of Investigation, Before the House Committee on Government Reform Subcommittee on Government Efficiency and Financial Management and Subcommittee on Technology Policy and the Census (Dec 2003) https://archives.fbi.gov/archives/news/testimony/information-technology-enhancing-interagency-cooperation (discussing "targeted, predictive pattern recognition algorithms" and continues that the "PEG will shortly begin a pilot testing of this capability to include the utilization of artificial intelligence and robotic searching models")

## Use Case #66

**Agency:** Department of Justice

**Subagency:** Federal Bureau of Investigation

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To conduct facial recognition from a mugshot database

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Federal Bureau of Investigation, Next Generation Identification (NGI), https://www.fbi.gov/services/cjis/fingerprints-and-other-biometrics/ngi (noting FBI system featuring "facial recognition search")

## Use Case #67

**Agency:** Department of Justice

**Subagency:** Office of Justice Programs

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To conduct facial detection, recognition, and identification using low quality or obscured images

**Method:** Regression

**Data Type:** Images

**Implementation Stage:** Planning

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Insufficient detail

**Citation:** National Institute of Justice, Using Artificial Intelligence to Address Criminal Justice Needs (Oct. 8, 2018), https://nij.ojp.gov/topics/articles/using-artificial-intelligence-address-criminal-justice-needs#note12 (noting use of "AI-based facial recognition algorithms")

## Use Case #68

**Agency:** Department of Justice

**Subagency:** Office of Justice Programs

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To identify cases of likely victims of human trafficking and those who victimize them using machine learning and social network analysis.

**Method:** Structured Prediction

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Insufficient detail

**Citation:** National Institute of Justice, Combating Human Trafficking Using Structural Information in Online Review Sites (2018), https://external.ojp.usdoj.gov/selector/awardDetail?awardNumber=2018-75-CX-0031&fiscalYear=2018&applicationNumber=2018-91005-GA-IJ&programOffice=NIJ&po=NIJ (noting contract award to develop "machine learning models. . .trained using a ground truth dataset" to classify online reviews for possible human trafficking)

## Use Case #69

**Agency:** Department of Justice

**Subagency:** Office of Justice Programs

**Policy Area:** Law Enforcement

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To evaluate the impact of intrinsic factors (sex, population affiliation, and indicators of pathology/stress) and extrinsic factors of variation (Human Development Index [HDI] and Gini index, as indicators of life quality and social inequality, respectively) on juvenile age estimation at both local and global levels.

**Method:** Regression

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Lower

**Citation:** Department of Justice Office of Justice Programs, Quantifying the Impact of Intrinsic and Extrinsic Factors to Improve Juvenile Age Estimation (2017), https://nij.ojp.gov/funding/awards/2017-dn-bx-0144 (noting the use of "transition analysis and neural network algorithms ... to construct population-specific and universal models for age estimation")

## Use Case #70

**Agency:** Department of Justice

**Subagency:** Office of Justice Programs

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To quantify and map gang activity in order to predict emerging areas of gang conflict.

**Method:** Structured Prediction

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Medium

**Citation:** Department of Justice, Office of Justice Programs, Chicago Police Department's Predictive Policing Demonstration and Evaluation Program (2019), https://home.chicagopolice.org/wp-content/uploads/2019/01/FACT-SHEET-Crime-and-Victimization-Risk-Model-1.pdf (noting, at page 4, that the model's "form and its parameters were learned empirically as part of model training")

## Use Case #71

**Agency:** Department of Justice

**Subagency:** Office of Justice Programs

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To facilitate gunshot detection

**Method:** Classification

**Data Type:** Audio

**Implementation Stage:** Planning

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Justice Office of Justice Programs, Development of Computational Methods for the Audio Analysis of Gunshots (May 2019), https://www.ncjrs.gov/pdffiles1/nij/grants/252947.pdf (noting, at page 1, use of "a fine-grained mathematical representation of the frequency spectrum with a series

of advanced machine learning techniques for clustering and pattern recognition")

## Use Case #72

**Agency:** Department of Justice

**Subagency:** Office of Justice Programs

**Policy Area:** Law Enforcement

**Task:** Enforcement, Regulatory research, analysis, and monitoring

**Task Description:** To produce an empirically-tested dynamic risk assessment protocol to anticipate the imminent risk of violence, and a computationally efficient tool based on this new protocol that enables law enforcement to mine, monitor, and screen for the occurrence of risk indicators in large law enforcement databases.

**Method:** Classification

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Justice Office of Justice Programs, Dynamic, Graph-Based Risk Assessments for the Detection of Violent Extremist Radicalization Trajectories Using Large Scale

Social and Behavioral Data (2017), https://nij.ojp.gov/funding/awards/2017-za-cx-0002 (noting in the award description that "machine learning will be applied to the enhanced database of behavioral indicators to develop algorithms for the dynamic risk assessment tool")

## Use Case #73

**Agency:** Department of Justice

**Subagency:** Office of Justice Programs

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To enable the tracking of an individual across surveillance video from cameras with non-overlapping fields of view over a wide area.

**Method:** Regression

**Data Type:** Images

**Implementation Stage:** Planning

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Justice, Office of Justice Programs, Learning Models for Predictive Behavioral Intent and Activity Analysis in Wide Area Video Surveillance (Oct. 2016), https://www.ncjrs.gov/pdffiles1/nij/grants/250273.pdf (noting, on page 3, that the objective of the program is "to develop an intelligent, non-obtrusive, real-time, continuous monitoring system for assessing activity and predicting emergent suspicious and criminal behavior across a network of distributed cameras")

## Use Case #74

**Agency:** Department of Justice

**Subagency:** Office of Justice Programs

**Policy Area:** Law Enforcement

**Task:** Enforcement, Regulatory research, analysis, and monitoring

**Task Description:** To identify victim, perpetrator and community-level and sociocultural risk factors for elder financial exploitation in order to inform the development of targeted public service announcements as well as to enhance law enforcement prevention efforts.

**Method:** Classification

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Justice Office of Justice Programs, Research and Evaluation on the Abuse, Neglect and Exploitation of Elderly Individuals and Residents of Residential Care Facilities (May 2013) https://nij.ojp.gov/funding/opportunities/nij-2013-3459 (noting in the project description that "Bayesian model averaging, which provides the most accurate set of risk factors when using predictive models, will be used to determine the best set of risk factors")

## Use Case #75

**Agency:** Department of Justice

**Subagency:** Office of Justice Programs

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To refine DNA analysis, especially in cases involving DNA from multiple individuals

**Method:** Classification

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Justice Office of Justice Programs, Using Artificial Intelligence to Address Criminal Justice Needs (Oct. 8, 2018), https://nij.ojp.gov/topics/articles/using-artificial-intelligence-address-criminal-justice-needs (noting that research project combines "the strengths of approaches involving human analysts with data mining and AI algorithms")

## Use Case #76

**Agency:** Department of Justice

**Subagency:** Office of Justice Programs

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To discover knowledge and recognize patterns from online data across dark web and Internet that could provide valuable investigative leads, which might greatly facilitate law enforcement preventing, responding to, and disrupting the networks of opioid trafficking. This

project will design and develop an intelligent system (named AlphaDetective) leveraging the latest advances in artificial intelligence technologies to automate the analysis of these data and link participants on the dark web to the Internet to provide timely investigative leads to law enforcements in the U.S.

**Method:** Classification

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Justice Office of Justice Programs, Using Artificial Intelligence Technologies to Expose Darknet Opioid Traffickers (2018), https://nij.ojp.gov/funding/awards/2018-75-cx-0032 (noting a grant to utilize "Artificial Intelligence (AI) technologies to discover knowledge and recognize patterns from online data across dark web")

### Use Case #77

**Agency:** Department of Justice

**Subagency:** Office of Justice Programs

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To identify a license plate from low quality images

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Planning

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Higher

**Citation:** National Institute of Justice, Using Artificial Intelligence to Address Criminal Justice Needs (Oct. 8, 2018), https://nij.ojp.gov/topics/articles/using-artificial-intelligence-address-criminal-justice-needs#note13 (noting use of "AI algorithms")

### Use Case #78

**Agency:** Department of Justice

**Subagency:** Office of Justice Programs

**Policy Area:** Law Enforcement

**Task:** Enforcement

**Task Description:** To provide text describing objects and relationships between them for crime detection.

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Fully deployed

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Higher

**Citation:** National Institute of Justice, Using Artificial Intelligence to Address Criminal Justice Needs (Oct. 8, 2018), https://nij.ojp.gov/topics/articles/using-artificial-intelligence-address-criminal-justice-needs#note12 (noting use of "algorithms" in NIJ overview of AI applications to criminal justice)

## DEPARTMENT OF LABOR

### Use Case #79

**Agency:** Department of Labor

**Subagency:** Bureau of Labor Statistics

**Policy Area:** Labor and Employment

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To establish an Automated Coding of Worker Injury Narratives

**Method:** Classification

**Data Type:** Text

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Higher

**Citation:** U.S. Bureau of Labor Statistics, Deep Neural Networks for Worker Injury Autocoding (Sep. 2017), https://www.bls.gov/iif/deep-neural-networks.pdf (noting, at page 2, "the limitations of SOII's existing autocoders and then [discussing] a new neural network autocoder that demonstrates substantial improvements")

### Use Case #80

**Agency:** Department of Labor

**Subagency:** Bureau of Labor Statistics

**Policy Area:** Labor and Employment

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To conduct research related to the consumer price index

**Method:** Regression

**Data Type:** Structured

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Lower

**Citation:** U.S. Bureau of Labor Statistics, Price and Index Number Research, https://www.bls.gov/pir/overview.htm (noting research using "machine learning algorithms" to perform CPI quality adjustment analysis)

## Use Case #81

**Agency:** Department of Labor

**Subagency:** Bureau of Labor Statistics

**Policy Area:** Labor and Employment

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To learn about Respondents' Characteristics Using Standard Exploratory Data Analysis (EDA) Tools and interpret nonresponse rates.

**Method:** Classification, Regression, Clustering

**Data Type:** Structured

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Lower

**Citation:** MoonJung Cho & Larry Lang, Learning About Respondents' Characteristics Using Standard Exploratory Data Analysis (EDA) Tools (2016), https://www.bls.gov/osmr/research-papers/2016/pdf/st160230.pdf (noting, at pages 722-24, use of k-means clustering and regression trees)

## Use Case #82

**Agency:** Department of Labor

**Subagency:** Bureau of Labor Statistics

**Policy Area:** Labor and Employment

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To model topics in survey interviewer notes for the Consumer Expenditure Interview Survey

**Method:** Clustering

**Data Type:** Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** Bureau of Labor Statistics, Modeling Topics in Survey Interviewer Notes (2018), https://www.bls.gov/cex/research_papers/pdf/modeling-topics-in-survey-interviewer-notes.pdf (noting, at slide 3, use of multiple machine learning techniques, including natural language processing, model-based and Bayes clustering, and classification trees)

## Use Case #83

**Agency:** Department of Labor

**Subagency:** Bureau of Labor Statistics

**Policy Area:** Labor and Employment

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To code worker injury narratives.

**Method:** Regression

**Data Type:** Text

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Higher

**Citation:** Digital.gov, Machine Learning: How Bureau of Labor Statistics Did It (July 25, 2019), https://digital.gov/event/2019/07/25/machine-learning-how-bureau-labor-statistics-did-it/ (noting use of neural networks)

## Use Case #84

**Agency:** Department of Labor

**Subagency:** Mine Safety and Health Administration

**Policy Area:** Labor and Employment

**Task:** Enforcement, Regulatory research, analysis, and monitoring

**Task Description:** To predict whether or not a fatal or serious disabling injury is more likely to occur in the following 12-month period.

**Method:** Regression

**Data Type:** Structured, Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Lower

**Citation:** Mine Safety and Health Administration, Predictive Analytics with Administrative Data from the Mine Safety and Health Administration (March 2016), https://nces.ed.gov/

FCSM/pdf/F3_Dai_2015FCSM.pdf (noting that Summit LLC, in collaboration with the DOL, used "logistic regression and survival analysis to predict the delinquency probability and duration, respectively")

## DEPARTMENT OF THE INTERIOR

### Use Case #85

**Agency:** Department of the Interior

**Subagency:** United States Fish and Wildlife Service

**Policy Area:** Environment

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To create population genetics model for lake trout

**Method:** Classification

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Lower

**Citation:** United States Fish and Wildlife Service, Comparisons of Likelihood and Machine Learning Methods of Individual Classification (July 2002), https://www.fws.gov/lab/pdfs/Guinand_etal.2002.pdf (noting, at page 1, the use of "different nonparametric machine learning techniques with parametric likelihood estimations commonly employed in population genetics for purposes of assigning individuals to their population of origin")

### Use Case #86

**Agency:** Department of the Interior

**Subagency:** United States Fish and Wildlife Service

**Policy Area:** Environment

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To help the Kenai National Wildlife Refuge staff model bird, arthropod, and plant distributions using data collected as part of our Long-Term Ecological Monitoring program (LTEMP).

**Method:** Regression

**Data Type:** Structured, Images

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** U.S. Fish & Wildlife Service, Species Distribution and Climate Envelope Models (undated), https://www.fws.gov/refuge/Kenai/what_we_do/science/models.html (noting use of random forest machine-learning models)

### Use Case #87

**Agency:** Department of the Interior

**Subagency:** United States Geological Survey

**Policy Area:** Environment

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To describe migration phenologies. For example, can we provide a probabilistic description of migration events that can be validated by our field studies?

**Method:** Structured Prediction

**Data Type:** Images

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** United States Geological Survey, Evaluating Habitat Use by Pelagic Birds on the Western Great Lakes, and Airspace Use of Migrant Songbirds Near and Over the Western Great Lakes, https://www.usgs.gov/centers/umesc/science/evaluating-habitat-use-pelagic-birds-western-great-lakes-and-airspace-use?qt-science_center_objects=0#qt-science_center_objects (noting possible application of "machine learning algorithms to weather stations around the Great Lakes to describe migration phenologies")

### Use Case #88

**Agency:** Department of the Interior

**Subagency:** United States Geological Survey

**Policy Area:** Environment

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To track images of croplands across the globe. This is the baseline product of the GFSAD30 Project.

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** United States Geological Survey, Global Food Security-Support Analysis Data at 30 m, https://www.usgs.gov/

centers/wgsc/science/global-food-security-support-analysis-data-30-m?qt-science_center_objects=0#qt-science_center_objects (noting GFSAD use of "machine learning algorithms on Google Earth Engine cloud computing platform")

### Use Case #89

**Agency:** Department of the Interior

**Subagency:** United States Geological Survey

**Policy Area:** Environment

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To predict landslides and natural hazards

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** United States Geological Survey, Digamma. ai and the U.S. Geological Survey Announce Machine Learning Research Partnership (June 2018), https://www.prnewswire.com/news-releases/digammaai-and-the-us-geological-service-announce-machine-learning-research-partnership-300671930.html (citing a "new partnership to use machine learning to advance natural hazards research")

### Use Case #90

**Agency:** Department of the Interior

**Subagency:** United States Geological Survey

**Policy Area:** Environment

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To determine water quality and create water quality models using machine learning techniques

**Method:** Regression

**Data Type:** Structured, Text, Images

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** United States Geological Survey, Hydrology Monitoring Network: Data Mining and Modeling to Separate Human and Natural Hydrologic Dynamics (undated), https://www.usgs.gov/centers/sa-water/science/hydrology-monitoring-network-data-mining-and-modeling-separate-human-and?qt-science_center_objects=0#qt-science_center_objects (noting use of "artificial neural network (ANN) models" to analyze water-related data)

### Use Case #91

**Agency:** Department of the Interior

**Subagency:** United States Geological Survey

**Policy Area:** Environment

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To develop and demonstrate an automated Cropland Classification Algorithm (ACCA) that will rapidly, routinely, and accurately classify agricultural cropland extent, areas, and characteristics (e.g., irrigated vs. rainfed) over large areas such as a country or a region.

**Method:** Classification

**Data Type:** Structured, Images

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Lower

**Citation:** Prasad S. Themkabail & Shuoting Wu, An Automated Cropland Classification Algorithm (ACCA) for Tajikistan by Combinging Landsat, MODIS, and Secondary Data, 4 Remote Sensing 2890 (2012), https://pubs.er.usgs.gov/publication/70098947 (noting use of "classification algorithm")

### Use Case #92

**Agency:** Department of the Interior

**Subagency:** United States Geological Survey

**Policy Area:** Environment

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To help predict soil types and properties between field observations of soils.

**Method:** Data Unavailable

**Data Type:** Structured, Images

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** United States Geological Survey, Digital Soil Mapping: High Resolution Maps for Modern Land Management

Decisions (undated but listed as active), https://www.usgs.gov/centers/sbsc/science/digital-soil-mapping-high-resolution-maps-modern-land-management-decisions?qt-science_center_objects=0#qt-science_center_objects (noting use of random forest machine learning models)

### Use Case #93

**Agency:** Department of the Interior

**Subagency:** United States Geological Survey

**Policy Area:** Environment

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To build a novel, first-of-its-kind, global hyperspectral imaging spectral-library of agricultural crops

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** United States Geological Survey, Global Hyperspectral Imaging Spectorscopy of Agricultural-Crops & Vegetation (GHISA) (undated, but listed as active), https://www.usgs.gov/centers/wgsc/science/global-hyperspectral-imaging-spectroscopy-agricultural-crops-vegetation-ghisa?qt-science_center_objects=0#qt-science_center_objects (noting use of "machine learning algorithms (e.g., Support Vector Machines)")

### Use Case #94

**Agency:** Department of the Interior

**Subagency:** United States Geological Survey

**Policy Area:** Environment

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To initiate analysis of the natural and anthropogenic consequences of extensive ore and trace mineralization in the southern midcontinent of the U.S.

**Method:** Data Unavailable

**Data Type:** Images

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** United States Geological Survey, Geochemical Signatures and Environmental Impacts of Ore and Trace Mineralization in the Southern Midcontinent (undated, but listed as active), https://www.usgs.gov/energy-and-minerals/mineral-resources-program/science/geochemical-signatures-and-environmental?qt-science_center_objects=0#qt-science_center_objects (noting use of machine learning techniques)

## DEPARTMENT OF THE TREASURY

### Use Case #95

**Agency:** Department of the Treasury

**Subagency:** Internal Revenue Service

**Policy Area:** Financial Regulation

**Task:** Internal management

**Task Description:** To proactively detect and respond to cyber- and insider-related threats

**Method:** Data Unavailable

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Internal Revenue Service, Advanced Analytics, Artificial Intelligence and Machine Learning Capabilities for the Cybersecurity Cloud Solution Program (Dec 2018), https://beta.sam.gov/opp/d5df279d2729d1c5b70d71b1b8c3dbf3/view (noting "need for an Artificial Intelligent (AI) machined-based analytical platform to proactively detect and respond to cyber- and insider-related threats")

### Use Case #96

**Agency:** Department of the Treasury

**Subagency:** Internal Revenue Service

**Policy Area:** Financial Regulation

**Task:** Enforcement

**Task Description:** To assess risk of fraudulent returns

**Method:** Classification

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Treasury Inspector General for Tax Administration, The Return Review Program Increases Fraud Detection;

However, Full Retirement of the Electronic Fraud Detection System Will Be Delayed (Sep. 25, 2017), https://www.treasury.gov/tigta/auditreports/2017reports/201720080fr.pdf (noting "machine learning algorithms" for generating fraud risk scores)

## DEPARTMENT OF TRANSPORTATION

### Use Case #97

Agency: Department of Transportation

Subagency: Federal Aviation Administration

Policy Area: Transportation

Task: Regulatory research, analysis, and monitoring, Public services and engagement

Task Description: To continually sample information about one's own vehicle and nearby aircraft, then use that data as the basis for calculations to determine the best course. The idea is to avoid collisions while minimizing the number of recommended maneuvers that the human pilot or the drone's autopilot must make.

Method: Regression

Data Type: Structured

Implementation Stage: Planning

Developer: Non-Commercial Collaboration

Level of Sophistication: Higher

Citation: Stanford Engineering, Can Neural Networks Help Make Air Traffic Control Safer? (Nov. 14, 2016), https://aa.stanford.edu/news/can-neural-networks-help-make-air-traffic-control-safer (noting FAA collaboration to apply neural network analysis)

### Use Case #98

Agency: Department of Transportation

Subagency: Federal Highway Administration

Policy Area: Transportation

Task: Regulatory research, analysis, and monitoring

Task Description: To enable transportation professionals to more accurately model lane-changing behavior on freeways

Method: Regression

Data Type: Images

Implementation Stage: Fully deployed

Developer: Commercial Contractor

Level of Sophistication: Insufficient detail

Citation: James Colyar, FHWA Traffic Analysis Tools & NGSIM Program (Apr. 19, 2006), https://www.webpages.uidaho.edu/niatt/Internal/directors_notes/UIdaho%200406_NGSIM%20and%20Simulation_JColyar.pdf (noting agency development of "a core of driver behavior algorithms")

### Use Case #99

Agency: Department of Transportation

Subagency: Federal Transit Administration

Policy Area: Transportation

Task: Regulatory research, analysis, and monitoring, Public services and engagement

Task Description: To develop prototype applications in the areas of wayfinding and navigation, safe intersection crossing, and pre-trip concierge and visualization. ATTRI is yielding prototypes for future large-scale demonstration and deployment. Expected deliverable dates are pending completion of each project.

Method: Robotics

Data Type: Structured

Implementation Stage: Planning

Developer: Commercial Contractor

Level of Sophistication: Insufficient detail

Citation: Federal Transit Administration, Annual Report on Public Transportation Innovation Research Projects for FY 2017 (Feb. 2018), https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/115886/fta-annual-report-public-transportation-innovation-research-projects-fy-2017-fta-report-no-0120.pdf (noting, at p. 21, a long-term, multi-agency effort to use "robotics" and "artificial intelligence" to advance accessible transportation)

### Use Case #100

Agency: Department of Transportation

Subagency: Federal Transit Administration

Policy Area: Transportation

Task: Regulatory research, analysis, and monitoring

Task Description: To train statistical models to predict crashes. To understand the relationship pedestrian fatalities may have with transportation system and built environment characteristics. This pilot has laid the foundation needed for a future nationwide scale-up of a crash count tool.

Method: Regression

**Data Type:** Structured, Images

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** Erika Sudderth, et al., Estimating Traffic Crash Counts Using Crowdsourced Data, Volpe Center (June 2018), https://www.transportation.gov/sites/dot.gov/files/docs/mission/office-policy/transportation-policy/313951/estimating-crashes-crowdsourced-data-061418.pdf (noting, at slides 9-10, use of "supervised classification," including random forest models, to predict crash events)

## DEPARTMENT OF VETERANS AFFAIRS

### Use Case #101

**Agency:** Department of Veterans Affairs

**Subagency:** N/A

**Policy Area:** Social Welfare

**Task:** Regulatory research, analysis, and monitoring, Public services and engagement

**Task Description:** To understand and strengthen veterans' mental and emotional wellbeing particularly in the transition from active duty to civilian life using a digital assistant powered by IBM's Watson.

**Method:** Data Unavailable

**Data Type:** Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** U.S. Department of Veterans Affairs, VA Partners with Tech Companies to Prevent Veteran Suicide, VA Blog (undated), https://www.blogs.va.gov/VAntage/56574/va-partners-tech-companies-prevent-veteran-suicide/ (noting incorporation of IBM Watson)

### Use Case #102

**Agency:** Department of Veterans Affairs

**Subagency:** N/A

**Policy Area:** Social Welfare

**Task:** Regulatory research, analysis, and monitoring, Public services and engagement

**Task Description:** To build a medical knowledge graph with deep learning to inform medical decision-making and train artificial intelligence (AI) to personalize care plans.

**Method:** Classification

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** U.S. Department of Veterans Affairs Will Collaborate with Flow Health to Bring Artificial Intelligence and Precision Medicine to Veterans, BuinessWire (Nov. 29, 2016), https://www.businesswire.com/news/home/20161129005475/en/U.S.-Department-Veterans-Affairs-Collaborate-Flow-Health (noting five-year contract to develop a "deep learning" system for personalizing veteran care plans)

### Use Case #103

**Agency:** Department of Veterans Affairs

**Subagency:** N/A

**Policy Area:** Social Welfare

**Task:** Public services and engagement

**Task Description:** To assist VA agents and Veterans / caregivers using either a chat or voice interface. AI can be trained to answer commonly asked questions, assist users in properly filling out forms, respond to routine issues, and assist VA agents to quickly locate key information relevant to a customer's specific concern. Initially, AI must be taught using assisted learning, but once it is put into production it can learn over time to both expand and improve its own capabilities.

**Method:** Data Unavailable

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Department of Veterans Affairs, Request for Information, Improved Veteran Experience Through Use of Artificial Intelligence (AI) (July 2018), https://www.vendorportal.ecms.va.gov/FBODocumentServer/DocumentServer.aspx?DocumentId=4453008&FileName=36C10B18Q2991-000.docx (requesting proposals for an AI-based "chat or voice interface")

### Use Case #104

**Agency:** Department of Veterans Affairs

**Subagency:** N/A

**Policy Area:** Social Welfare

**Task:** Regulatory research, analysis, and monitoring, Public services and engagement

**Task Description:** To identify risk factors for patient deterioration and predict its onset

**Method:** Classification

**Data Type:** Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** U.S. Department of Veterans Affairs, VA Partners with DeepMind to Build Machine Learning Tools to Identify Health Risks for Veterans (Feb. 21, 2018), https://www.va.gov/opa/pressrel/pressrelease.cfm?id=4013 (noting use of "machine learning algorithms")

### Use Case #105

**Agency:** Department of Veterans Affairs

**Subagency:** N/A

**Policy Area:** Social Welfare

**Task:** Regulatory research, analysis, and monitoring, Public services and engagement

**Task Description:** To identify veterans who are at elevated risk for suicide.

**Method:** Regression

**Data Type:** Text

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Lower

**Citation:** Ronald C. Kessler et al., Developing a Practical Suicide Risk Prediction Model for Targeting High-Risk Patients in the Veterans Health Administration, 26 Int'l J. Methods Psychiatric Res. (July 2014), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5614864/ (noting deployment of "commonly-used machine learning algorithms," including "Bayesian additive regression trees")

## ENVIRONMENTAL PROTECTION AGENCY

### Use Case #106

**Agency:** Environmental Protection Agency

**Subagency:** N/A

**Policy Area:** Environment, Science

**Task:** Enforcement, Regulatory research, analysis, and monitoring

**Task Description:** To predict toxicities in chemical compounds; flags for further in-depth analysis by agency

**Method:** Clustering

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Lower

**Citation:** George Helman et al., Generalised Read-Across GenRA, Research, Implementation and Practical Application, Oct. 30, 2018, https://cfpub.epa.gov/si/si_public_record_report.cfm?Lab=NCCT&dirEntryId=342367 (describing nearest neighbor algorithm for generalized read-across or toxicity); Lisa Truong et al., Quantitative Predictive Models for Systemic Toxicity, https://figshare.com/articles/Quantitative_Predictive_Models_for_Systemic_Toxicity/5178820 (detailing ToxCast modeling effort applying machine learning techniques, including train-test split and validation)

## EQUAL EMPLOYMENT OPPORTUNITY COMMISSION

### Use Case #107

**Agency:** Equal Employment Opportunity Commission

**Subagency:** N/A

**Policy Area:** Labor and Employment

**Task:** Enforcement, Regulatory research, analysis, and monitoring

**Task Description:** To predict groups in specific industries that may be susceptible to facing workplace discrimination

**Method:** Data Unavailable

**Data Type:** Structured, Text

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Equal Employment Opportunity Commission, Evaluation of the EEOC's Data Analytics Activities Final Report (Sept 2018), https://oig.eeoc.gov//sites/default/files/audits/EEOC%20Data%20Analytics%20Report%20Final%20.pdf (assessing potential "improvements, opportunities, and best practices regarding EEOC's data analysis and predictive analytics activities" and recommending adoption of "text analytics" and "proven modeling approaches and model management techniques")

## EXECUTIVE OFFICE FOR IMMIGRATION REVIEW

### Use Case #108

**Agency:** Executive Office for Immigration Review

**Subagency:** N/A

**Policy Area:** Law Enforcement

**Task:** Internal management

**Task Description:** To automate technology business management and analyze technology costs

**Method:** Classification, Clustering

**Data Type:** Structured, Text

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Apptio, Apptio Introduces Machine Learning and Intelligence Analytics to Automate and Simplify TBM Across U.S. Federal Agencies, PRNewswire (July 11, 2018), https://www.apptio.com/company/news/press-releases/apptio-introduces-machine-learning-and-intelligent-analytics-to-automate-and-simplify-tbm-across-u.s.-federal-agencies/ (noting use of "[m]achine learning capabilities" within software platform and noting FedRAMP certification and work "with many federal agencies, including the General Services Administration, OMB, Department of Veterans Affair (VA), Department of Homeland Security (DHS), the Department of Justice's Executive Office for Immigration Review (DOJ - EOIR), and more")

## FEDERAL COMMUNICATIONS COMMISSION

### Use Case #109

**Agency:** Federal Communications Commission

**Subagency:** N/A

**Policy Area:** Communications

**Task:** Public services and engagement

**Task Description:** To facilitate auctioning of unneeded airwaves

**Method:** Structured Prediction

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** UBC Science, How AI Helped the FCC Auction Off $19-Billion Worth of Radio Spectrum (June 26, 2017), https://science.ubc.ca/news/how-ai-helped-fcc-auction-19-billion-worth-radio-spectrum (noting collaboration with FCC); Kevin Leyton-Brown, Paul Milgrom, & Ilya Segal, Economics and Computer Science of a Radio Spectrum Reallocation, 114 PNAS 7202 (2017), https://www.pnas.org/content/114/28/720 (noting use of machine learning and an "algorithm portfolio")

## FEDERAL DEPOSIT INSURANCE CORPORATION

### Use Case #110

**Agency:** Federal Deposit Insurance Corporation

**Subagency:** N/A

**Policy Area:** Financial Regulation

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To identify "systemically important financial institutions (SIFIs)" with risk of default so FDIC could undertake necessary preparatory actions for resolution

**Method:** Data Unavailable

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Federal Deposit Insurance Corporation, Office of Inspector General, The FDIC's Risk Monitoring of Systemically Important Financial Institutions Proximity and Speed to

Default or Danger of Default (Jan. 2017), https://www.fdicoig.gov/publications/fdics-risk-monitoring-systemically-important-financial-institutions-proximity-and-speed (noting use of "algorithms" and an "algorithmic" approach to set risk triggers)

## FEDERAL RAILROAD ADMINISTRATION

### Use Case #111

**Agency:** Federal Railroad Administration

**Subagency:** N/A

**Policy Area:** Transportation

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To conduct risk analysis of broken rails due to rail defects

**Method:** Data Unavailable

**Data Type:** Images

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Federal Railroad Administration, Artificial Intelligence Research at FRA (June 2019), https://www.its.dot.gov/presentations/itsa_2019/Baillargeon_ITS19_20190523.pdf (noting, on slide 4 under strategic goals for AI, the development of "AI-based Risk Analyses & Processing")

## GENERAL SERVICES ADMINISTRATION

### Use Case #112

**Agency:** General Services Administration

**Subagency:** Office of Acquisition Policy

**Policy Area:** Other

**Task:** Internal management

**Task Description:** To create a fully interoperable talent management capability

**Method:** Data Unavailable

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** General Services Administration Office of Acquisition Policy, U.S. General Services Administration and U.S. Office of Personnel Management FY 2020 Congressional Justification (March 2019), https://cdn.govexec.com/media/gbc/docs/pdfs_edit/031919ew1.pdf (noting, at pages 66-67, the "development of the End-to-End HR Service Delivery capability" that "will seek to provide a unified user experience with multifactor/single sign-on, adopt cloud characteristics and implement an initial set of advanced technologies such as talent analytics, robotics process automation, artificial intelligence/machine learning, or mobile capabilities")

### Use Case #113

**Agency:** General Services Administration

**Subagency:** Office of Acquisition Policy

**Policy Area:** Other

**Task:** Public services and engagement, Internal management

**Task Description:** To reduce the amount of human interaction required to review new proposal documents from solicitations, improve offeror experience during the new offer proposal process, and reduce the review time for new proposal reviews to award.

**Method:** Data Unavailable

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** GovTribe, FAStLane Automation RFQ (June 27, 2017), https://govtribe.com/opportunity/federal-contract-opportunity/fastlane-automation-rfq-qtf0017hm1000 (detailing GSA request for quotation for "automated machine learning technology" to analyze new procurement proposals)

### Use Case #114

**Agency:** General Services Administration

**Subagency:** Office of Assisted Acquisition Services

**Policy Area:** Other

**Task:** Public services and engagement

**Task Description:** To help visitors to the Federal Help Desk get information, provide login support, and perform searches in a single communication channel

**Method:** Structured Prediction

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Medium

**Citation:** General Services Administration Office of Assisted Acquisition Services, Breaking into Artificial Intelligence: Meet Our USAGov ChatBot! (April 2019), https://blog.usa.gov/breaking-into-artificial-intelligence-meet-sam-the-chatbot ("In late 2018, we blended our exploration of AI and expertise in scams to launch our chatbot.")

### Use Case #115

**Agency:** General Services Administration

**Subagency:** Office of Public Affairs

**Policy Area:** Other

**Task:** Internal management

**Task Description:** To automatically predict whether federal solicitations posted on fbo.gov are compliant with Section 508 of the Rehabilitation Act and alert responsible parties of non-compliance so that corrective actions could be taken.

**Method:** Classification

**Data Type:** Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** General Services Administration, Game Changers: Artificial Intelligence Part II (March 2018), https://www.gsa.gov/about-us/newsroom/congressional-testimony/game-changers-artificial-intelligence-part-ii-artificial-intelligence-and-the-federal-government (noting that "the SRT AI platform uses natural language processing, text mining, and machine learning algorithms to automatically predict whether federal solicitations posted on fbo.gov are compliant with Section 508 of the Rehabilitation Act and alert responsible parties of non-compliance so that corrective actions could be taken")

## LEGAL SERVICES CORPORATION

### Use Case #116

**Agency:** Legal Services Corporation

**Subagency:** N/A

**Policy Area:** Other

**Task:** Public services and engagement

**Task Description:** To identify legal problems and connect users to resources and services that fit their needs

**Method:** Data Unavailable

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Legal Services Corporation, Legal Navigator (2016), https://www.lsc.gov/simplifying-legal-help (noting use of "machine learning system," including natural language processing, to power Legal Navigator, a "chatbot-like interface")

## NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

### Use Case #117

**Agency:** National Aeronautics and Space Administration

**Subagency:** N/A

**Policy Area:** Science, Transportation

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To conduct more science, improve response to track science phenomena and natural hazards, and increase the efficiency of operations.

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Fully deployed

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Higher

**Citation:** United States Senate, Hearing, The Dawn of Artificial Intelligence, Committee on Commerce, Science and Transportation, Subcommittee on Space, Science, and Competitiveness (Nov. 30, 2016) (noting, at p. 33, multiple uses of machine learning and other "AI-based software"); Jesse Emspak, With a Better Brain, Curiosity Mars Rover Picks Its Own Targets, Space.com (June 28, 2017), https://www.space.com/37326-curisoty-rover-picks-its-own-targets.html (noting computer vision applications and training protocols)

## Use Case #118

**Agency:** National Aeronautics and Space Administration

**Subagency:** N/A

**Policy Area:** Science, Transportation

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To enable collaboration between sensors in a network so that machine learning agents are able to autonomously improve performance

**Method:** Classification, Clustering

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Insufficient detail

**Citation:** National Aeronautics and Space Administration, CODEX Collaborative Learning for Sensor Networks https://ml.jpl.nasa.gov/products/codex/codex.html (noting the creation of a "learning system that enables collaboration so that the agents can autonomously improve their performance")

## Use Case #119

**Agency:** National Aeronautics and Space Administration

**Subagency:** N/A

**Policy Area:** Science, Transportation

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To automate the detection of clouds and distinguishing between different types of clouds and aerosols

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** National Aeronautics and Space Administration, Multi-angle Imaging Spectro Radiometer Automated Cloud Classification (Ongoing), https://ml.jpl.nasa.gov/projects/misr/misr.html (noting application of "machine learning technology to . . . complement the physics-based algorithms currently being used by scientists")

## Use Case #120

**Agency:** National Aeronautics and Space Administration

**Subagency:** N/A

**Policy Area:** Science, Transportation

**Task:** Regulatory research, analysis, and monitoring, Public services and engagement

**Task Description:** To provide situationally relevant info to flight crew

**Method:** Classification, Regression, Structured Prediction

**Data Type:** Structured, Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Higher

**Citation:** National Aeronautics and Space Administration, Pilot-Engaged Expert Response using IBM Watson Technology (Oct. 2018), https://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20180007515.pdf (noting, at page 9, use of the Watson Discovery Advisor, a system "that orchestrates an ensemble of search technologies, natural language processing algorithms, and machine learning models, enabling users to find information in a large body of unstructured natural language text by posing simple, natural language questions to the system")

## Use Case #121

**Agency:** National Aeronautics and Space Administration

**Subagency:** N/A

**Policy Area:** Science, Transportation

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To dynamically and autonomously detect changes in transient surface landmarks.

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Higher

**Citation:** National Aeronautics and Space Administration, Detecting Transient Surface Features with Dynamic Landmarking (Oct. 2009), https://landmarks.jpl.nasa.gov/papers/wagstaff-PImeeting-09.pdf (noting, at page 11, the use of "k-nearest neighbors" to create a relative landmark graph)

### Use Case #122

**Agency:** National Aeronautics and Space Administration

**Subagency:** N/A

**Policy Area:** Science, Transportation

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To evaluate the geological data collected by the Mars rover to prioritize the data for transmission to Earth.

**Method:** Robotics

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Higher

**Citation:** Rebecca Castano et al., OASIS: Onboard Autonomous Science Investigation System for Opportunistic Rover Science (undated), https://planning.jpl.nasa.gov/public/documents/papers/castano_jfr07_oasis.pdf (detailing development of autonomous rover system)

### Use Case #123

**Agency:** National Aeronautics and Space Administration

**Subagency:** N/A

**Policy Area:** Science, Transportation

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To improve the accuracy of predictions of future agricultural conditions

**Method:** Classification, Regression, Clustering

**Data Type:** Structured

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Medium

**Citation:** NASA Jet Propulsion Laboratory, Harvist Project Page (undated), https://harvist.jpl.nasa.gov/ (noting use of support vector machines and clustering)

### Use Case #124

**Agency:** National Aeronautics and Space Administration

**Subagency:** N/A

**Policy Area:** Science, Transportation

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To enable large-scale radio astronomy data analysis in real time

**Method:** Classification

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** NASA Jet Propulsion Lab, Machine Learning and Instrument Autonomy Group, Adaptive Deata Processing for Next Generation Radio Arrays (undated), https://ml.jpl.nasa.gov/projects/adpngra/adpngra.html (noting use of "machine learning methods")

### Use Case #125

**Agency:** National Aeronautics and Space Administration

**Subagency:** N/A

**Policy Area:** Science, Transportation

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To elicit, model, and incorporate investigator preferences into fast, automated analysis in radio and optical astronomy

**Method:** Classification

**Data Type:** Images

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** NASA Jet Propulsion Lab, IMBUE: Machine Learning for Big Data Understanding and Explanation (undated), https://imbue.jpl.nasa.gov/ (noting multiple applications of machine learning in radio and optical astronomy)

## NATIONAL AGRICULTURAL STATISTICS SERVICE

### Use Case #126

**Agency:** National Agricultural Statistics Service

**Subagency:** N/A

**Policy Area:** Agriculture

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To predict country yield of agricultural products based on weekly measurements of the Normalized Difference Vegetation Index (NDVI) during the growing season and temperature data from satellites over the past 6 years

**Method:** Regression

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Lower

**Citation:** David M. Johnson, An Assessment of Pre- and Within-Season Remotely Sensed Variables for Forecasting Corn and Soybean Yields in the United States, 141 Remote Sensing of Environment 116 (2013), https://www.nass.usda.gov/Research_and_Science/Cropland/docs/JohnsonRSE14_Yield.pdf (noting use of regression tree models)

## NATIONAL ARCHIVES AND RECORDS ADMINISTRATION

### Use Case #127

**Agency:** National Archives and Records Administration

**Subagency:** N/A

**Policy Area:** Other

**Task:** Internal management

**Task Description:** To organize and archive documents using natural language processing

**Method:** Data Unavailable

**Data Type:** Text

**Implementation Stage:** Fully deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** National Archives and Records Administration, A Window on the Archives of the Future (Jan. 2011), https://www.tacc.utexas.edu/-/a-window-on-the-archives-of-the-future (describing a research "collaboration" between NARA and the University of Texas to use "alignment algorithms and Natural Language Processing methods" to organize archival records)

## NATIONAL INSTITUTE OF FOOD AND AGRICULTURE

### Use Case #128

**Agency:** National Institute of Food and Agriculture

**Subagency:** N/A

**Policy Area:** Agriculture, Science

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To conduct monitoring, analytics, and automation in precision crop agriculture and precision livestock farming. Provide solutions to AI challenges including testing, validation and effective

implementation in agricultural applications.

**Method:** Data Unavailable

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** National Institute of Food and Agriculture, Agriculture and Food Research Initiative Competitive Grants Program (2018), https://nifa.usda.gov/sites/default/files/rfa/20190507-fy2019-afri-foundational-and-applied-science-rfa.pdf (noting, at page 70, that the Foundational and Applied Science program is seeking "projects that apply artificial intelligence and machine learning for monitoring, analytics, and automation in precision crop agriculture and precision livestock farming")

## OFFICE OF THE DIRECTOR OF NATIONAL INTELLIGENCE

### Use Case #129

**Agency:** Office of the Director of National Intelligence

**Subagency:** Intelligence Advanced Research Projects Activity

**Policy Area:** Law Enforcement

**Task:** Enforcement, Internal management

**Task Description:** To combat Trojan attacks by inspecting other AIs for Trojans.

**Method:** Data Unavailable

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Medium

**Citation:** Office of the Director of National Intelligence, IARPA, Trojans in Artificial Intelligence (TrojAI) (2019), https://www.iarpa.gov/index.php/research-programs/trojai/trojai-baa (noting project, including calls for research proposals, to inspect AIs for trojans); trojai 0.2.10, https://pypi.org/project/trojai/#description (containing code that implements machine learning techniques)

## RAILROAD RETIREMENT BOARD

### Use Case #130

**Agency:** Railroad Retirement Board

**Subagency:** N/A

**Policy Area:** Labor and Employment, Social Welfare

**Task:** Internal management

**Task Description:** To conduct automated code transformation

**Method:** Data Unavailable

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** U.S. Railroad Retirement Board, Strategic Plan 2018-2022 (undated), https://rrb.gov/sites/default/files/2018-02/StrategicPlan2018-2022.pdf (noting, at page 9, use of "Artificial Intelligence (AI) based automated code transformation software" to update legacy mainframe systems)

## SECURITIES AND EXCHANGE COMMISSION

### Use Case #131

**Agency:** Securities and Exchange Commission

**Subagency:** Division of Economic and Risk Analysis

**Policy Area:** Financial Regulation

**Task:** Enforcement

**Task Description:** To identify investment advisors who may be violating securities laws

**Method:** Classification, Clustering

**Data Type:** Structured, Text

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Scott Bauguess, U.S. Securities and Exchange Commission, Keynote Address: The Role of Big Data, Machine Learning, and AI in Assessing Risks: a Regulatory Perspective (June 21, 2017), https://www.sec.gov/news/speech/bauguess-big-data-ai (noting use of "unsupervised learning algorithms" and a "second stage [machine learning] algorithm" trained on "past examination outcomes" to parse narrative disclosures and then predict wrongdoing)

### Use Case #132

**Agency:** Securities and Exchange Commission

**Subagency:** Division of Economic and Risk Analysis

**Policy Area:** Financial Regulation

**Task:** Enforcement, Regulatory research, analysis, and monitoring

**Task Description:** To analyze all transactions on the Consolidated Audit Trail System

**Method:** Classification

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Scott Bauguess, U.S. Securities and Exchange Commission, Machine Learning, and AI in Assessing Risks: a Regulatory Perspective (June 21, 2017), https://www.sec.gov/news/speech/bauguess-big-data-ai (noting that substantial data infusion of Consolidated Audit Trail will require "the analytic methods we are currently developing to reduce the enormous datasets into usable patterns of results")

### Use Case #133

**Agency:** Securities and Exchange Commission

**Subagency:** Division of Economic and Risk Analysis

**Policy Area:** Financial Regulation

**Task:** Enforcement

**Task Description:** To classify content in unstructured filings

**Method:** Data Unavailable

**Data Type:** Text

**Implementation Stage:** Fully deployed

**Developer:** Data Unavailable

**Level of Sophistication:** Insufficient detail

**Citation:** Scott Bauguess, U.S. Securities and Exchange Commission, The Hope and Limitations of Machine Learning in Market Risk Assessment (March 2015), https://cfe.columbia.edu/files/seasieor/center-financial-engineering/presentations/MachineLearningSECRiskAssessment030615public.pdf (noting, on slide 7 titled "ML applications at Commission," a text analytics application to "identify herding behavior in disclosures")

## Use Case #134

**Agency:** Securities and Exchange Commission

**Subagency:** Division of Economic and Risk Analysis

**Policy Area:** Financial Regulation

**Task:** Enforcement

**Task Description:** To identify abnormal corporate issuer disclosures to predict misconduct.

**Method:** Classification

**Data Type:** Structured, Text

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Scott Bauguess, U.S. Securities and Exchange Commission, Machine Learning, and AI in Assessing Risks: A Regulatory Perspective (June 21, 2017), https://www.sec.gov/news/speech/bauguess-big-data-ai (noting use of "text analytic methods" to "machine-measure" frequency of terms in filings)

## Use Case #135

**Agency:** Securities and Exchange Commission

**Subagency:** Division of Enforcement

**Policy Area:** Financial Regulation

**Task:** Enforcement

**Task Description:** To evaluate hedge fund returns

**Method:** Regression

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** Data Unavailable

**Level of Sophistication:** Insufficient detail

**Citation:** Scott W. Bauguess, U.S. Securities and Exchange Commission, The Hope and Limitations of Machine Learning in Market Risk Assessment, U.S. Securities and Exchange Commission (Mar. 6, 2015), https://cfe.columbia.edu/files/seasieor/center-financial-engineering/presentations/MachineLearningSECRiskAssessment030615public.pdf (noting, at slide 13, use of "proprietary risk analytics")

## Use Case #136

**Agency:** Securities and Exchange Commission

**Subagency:** Division of Enforcement

**Policy Area:** Financial Regulation

**Task:** Enforcement

**Task Description:** To identify suspicious trading activity and find connections among traders

**Method:** Classification, Clustering

**Data Type:** Structured, Text

**Implementation Stage:** Fully deployed

**Developer:** Data Unavailable

**Level of Sophistication:** Insufficient detail

**Citation:** Scott W. Bauguess, U.S. Securities and Exchange Commission, The Hope and Limitations of Machine Learning in Market Risk Assessment, U.S. Securities and Exchange Commission (Mar. 6, 2015), https://cfe.columbia.edu/files/seasieor/center-financial-engineering/presentations/MachineLearningSECRiskAssessment030615public.pdf (noting, at slide 7, a tool that uses machine learning to perform "pattern analysis")

## Use Case #137

**Agency:** Securities and Exchange Commission

**Subagency:** Market Abuse Unit, Analytics and Detection Center

**Policy Area:** Financial Regulation

**Task:** Enforcement

**Task Description:** To detect instances of insider trading

**Method:** Classification

**Data Type:** Structured, Text

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Mary Jo White, Chair, U.S. Securities and Exchange Commission, Remarks at the International Institute for Securities Market Growth and Development (April 8, 2016), https://www.sec.gov/news/statement/statement-mjw-040816.html (noting use of "advanced data analytics" within ARTEMIS program.

## Use Case #138

**Agency:** Securities and Exchange Commission

**Subagency:** Office of Compliance Inspections and Examinations

**Policy Area:** Financial Regulation

**Task:** Enforcement

**Task Description:** To analyze transaction data to identify front running, cherry picking, and window dressing.

**Method:** Classification

**Data Type:** Structured, Text

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Scott W. Bauguess, The Hope and Limitations of Machine Learning in Market Risk Assessment, U.S. Securities and Exchange Commission (Mar. 6, 2015), https://cfe.columbia.edu/files/seasieor/center-financial-engineering/presentations/MachineLearningSECRiskAssessment030615public.pdf (noting, at slide 7, the NEAT tool as among "ML applications at Commission")

### Use Case #139

**Agency:** Securities and Exchange Commission

**Subagency:** N/A

**Policy Area:** Financial Regulation

**Task:** Enforcement

**Task Description:** To assess risks of use of credit default swaps.

**Method:** Classification

**Data Type:** Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Lower

**Citation:** Scott W. Bauguess, U.S. Securities and Exchange Commission, Address to OpRisk North America: The Role of Big Data, Machine Learning, and AI in Assessing Risks: A Regulatory Perspective (June 21, 2017), https://www.sec.gov/news/speech/bauguess-big-data-ai#_ednref8 (noting use of "text analytics methods" as part of discussion of "rise of machine learning" at agency)

### Use Case #140

**Agency:** Securities and Exchange Commission

**Subagency:** N/A

**Policy Area:** Financial Regulation

**Task:** Enforcement

**Task Description:** To classify themes in tips, complaints, referrals (TCRs)

**Method:** Classification

**Data Type:** Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** Scott W. Bauguess, U.S. Securities and Exchange Commission, Address to OpRisk North America: The Role of Big Data, Machine Learning, and AI in Assessing Risks: A Regulatory Perspective (June 21, 2017), https://www.sec.gov/news/speech/bauguess-big-data-ai#_ednref8 (noting use of "topic modeling" and LDA machine learning methods)

## SMALL BUSINESS ADMINISTRATION

### Use Case #141

**Agency:** Small Business Administration

**Subagency:** N/A

**Policy Area:** Commerce

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To assess risk in loan operations and loan portfolios for SBA loans

**Method:** Regression

**Data Type:** Structured

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Lower

**Citation:** Small Business Administration, SBA Lender Risk Rating System, 75 Federal Register 9257 (Mar. 1, 2010), https://www.sba.gov/sites/default/files/files/lender_risk_rating_system.pdf (noting purely predictive risk rating models)

## SOCIAL SECURITY ADMINISTRATION

### Use Case #142

**Agency:** Social Security Administration

**Subagency:** Office of the Inspector General

**Policy Area:** Social Welfare

**Task:** Adjudication

**Task Description:** To implement a program to automate the

initial disability claim decision, requiring human review only for denied claims

**Method:** Classification

**Data Type:** Structured, Text

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Social Security Administration, Implementation Of The Future Systems Technology Advisory Panel's Recommendations (Aug 2012), https://oig.ssa.gov/sites/default/files/audit/full/pdf/A-14-12-11222_0.pdf (describing agency effort to "implement a program to automate the initial disability claim decision")

## Use Case #143

**Agency:** Social Security Administration

**Subagency:** N/A

**Policy Area:** Social Welfare

**Task:** Enforcement

**Task Description:** To identify disability insurance fraud. To implement a dynamic and flexible enterprise-wide anti-fraud solution that employs advanced data analytics to identify patterns indicative of fraud, improve the functionality for data-driven fraud activations, conduct real-time risk analysis, and integrate developing technology into our anti-fraud business processes.

**Method:** Classification

**Data Type:** Structured, Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Social Security Administration, Annual Performance Report, Fiscal Years 2017-2019 (Feb. 12, 2018), https://www.ssa.gov/budget/FY19Files/2019APR.pdf (noting, at pages 25-26, agency use of "data analytics and predictive modeling," including "industry-proven predictive analytics software," to identify fraud)

## Use Case #144

**Agency:** Social Security Administration

**Subagency:** N/A

**Policy Area:** Social Welfare

**Task:** Adjudication

**Task Description:** To convert unstructured medical information from SSDI applications to readable text and apply NLP.

**Method:** Classification

**Data Type:** Structured, Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** Data Unavailable

**Level of Sophistication:** Insufficient detail

**Citation:** Social Security Administration, Statement of Patricia Jonas, Deputy Commissioner for the Office of Analytics, Review, and Oversight for Social Security Administration (July 2018) https://www.ssa.gov/legislation/testimony_072518.html (noting in her testimony that "software called Intelligent Medical-language Analysis Generation, or IMAGEN, converts images of medical information to readable text, which allows us to apply data analytics to the information to improve policy compliance. In addition, using state-of-the-art Natural Language Processing (NLP) techniques, we are developing and will begin implementing by the end of the year, a new NLP application to provide decision support and enhanced quality control assistance in our disability claims process")

## Use Case #145

**Agency:** Social Security Administration

**Subagency:** N/A

**Policy Area:** Social Welfare

**Task:** Adjudication

**Task Description:** To identify and fast-track claims where a favorable disability determination is highly likely and medical evidence is readily available

**Method:** Classification

**Data Type:** Structured, Text

**Implementation Stage:** Fully deployed

**Developer:** Data Unavailable

**Level of Sophistication:** Insufficient detail

**Citation:** Administrative Review Process for Adjudicating Initial Disability Claims, 71 Fed. Reg. 16,424. 16,430 (Mar. 31, 2006) (to be codified at 20 C.F.R. pts. 404, 405, 416 & 422) (describing predictive model for quick disability determinations)

## Use Case #146

**Agency:** Social Security Administration

**Subagency:** N/A

**Policy Area:** Social Welfare

**Task:** Adjudication

**Task Description:** To identify patterns in adjudication that are given as feedback to judges

**Method:** Classification

**Data Type:** Structured, Text

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Office of the Inspector General, Social Security Administration, A-12-18-50353, Audit Report: The Social Security Administration's Use of Insight Software to Identify Potential Anomalies in Hearing Decisions 1 (2019) (describing "program that uses natural language processing and artificial intelligence technologies, to flag potential policy compliance or internal consistency errors")

### Use Case #147

**Agency:** Social Security Administration

**Subagency:** N/A

**Policy Area:** Social Welfare

**Task:** Adjudication

**Task Description:** To identify SSDI overpayments, redetermination cases with a high likelihood of error, potential overpayment in order to delay processing, and disability insurance determinations

**Method:** Regression

**Data Type:** Structured, Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Social Security Administration, Annual Performance Report 67-68 (2016), https://www.ssa.gov/budget/FY16Files/2016FCJ.pdf (describing predictive modeling to determine overpayments and cases with likely errors)

### Use Case #148

**Agency:** Social Security Administration

**Subagency:** N/A

**Policy Area:** Social Welfare

**Task:** Public services and engagement, Internal management

**Task Description:** To create a virtual assistant for customer support

**Method:** Structured Prediction

**Data Type:** Text

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Susan Miller, SSA Seeks Virtual Assistants To Help with Boomer Retirements, Sep. 4, 2018, https://gcn.com/articles/2018/09/04/ssa-virtual-assistant.aspx (noting that SSA is "looking for virtual assistant customer service support software that incorporates artificial intelligence and machine learning to allow for conversational interactions with clients and deliver a better self-service experience")

## UNITED STATES INTERNATIONAL TRADE COMMISSION

### Use Case #149

**Agency:** United States International Trade Commission

**Subagency:** N/A

**Policy Area:** Commerce, Foreign Affairs

**Task:** Regulatory research, analysis, and monitoring

**Task Description:** To analyze trade data and predict US trade flows with major trade partners

**Method:** Regression

**Data Type:** Structured, Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Lower

**Citation:** Issac Wohl & Jim Kennedy, Neural Network Analysis of International Trade (working paper 2018), https://www.usitc.gov/publications/332/working_papers/neural_networks_and_international_trade_-_compiled_draft_06.pdf (noting use of neural networks)

## UNITED STATES POSTAL SERVICE

### Use Case #150

**Agency:** United States Postal Service

**Subagency:** N/A

**Policy Area:** Communications

**Task:** Public services and engagement

**Task Description:** To perform handwriting recognition

**Method:** Classification

**Data Type:** Structured, Text, Images

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** Venu Govindaraju, Reading the Handwriting on the Letter (May 2016), https://www.buffalo.edu/content/dam/www/research/pdf/Postal-Automation-Highlights_20160516.pdf (noting, at slide 3, the USPS's development of a "learning-based system" for recognizing handwriting).

### Use Case #151

**Agency:** United States Postal Service

**Subagency:** N/A

**Policy Area:** Communications

**Task:** Public services and engagement

**Task Description:** To provide customers with two-hour time windows for upcoming parcel deliveries.

**Method:** Data Unavailable

**Data Type:** Structured

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** United States Postal Service, Office of Inspector General, Coordination and Optimization Technologies and Postal Applications (Sept. 6, 2018), https://www.uspsoig.gov/sites/default/files/document-library-files/2018/RARC-WP-18-014.pdf (noting, at page 5, use of machine learning algorithms and training data)

### Use Case #152

**Agency:** United States Postal Service

**Subagency:** N/A

**Policy Area:** Communications

**Task:** Public services and engagement

**Task Description:** To investigate the possibility of using unmanned aircraft systems to deliver mail

**Method:** Robotics

**Data Type:** Structured, Text, Images

**Implementation Stage:** Planning

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Request for Information Announcement, United States Postal Service Unmanned Aircraft System (UAS) (Sept. 23, 2019), https://govtribe.com/opportunity/federal-contract-opportunity/usps-unmanned-aircraft-system-uas-rfiuspsuas (calling for proposals for autonomous systems)

### Use Case #153

**Agency:** United States Postal Service

**Subagency:** N/A

**Policy Area:** Communications

**Task:** Public services and engagement

**Task Description:** To help customers track packages and figure out next steps

**Method:** Structured Prediction

**Data Type:** Text

**Implementation Stage:** Piloting or Partially Deployed

**Developer:** In-House

**Level of Sophistication:** Medium

**Citation:** United States Postal Service, Office of Inspector General, Getting Real with Artificial Intelligence (Jan. 29, 2018), https://www.uspsoig.gov/blog/getting-real-artificial-intelligence (describing pilot of chatbot to track deliveries)

### Use Case #154

**Agency:** United States Postal Service

**Subagency:** N/A

**Policy Area:** Communications

**Task:** Enforcement

**Task Description:** To identify workers' compensation claims, health care fraud, financial fraud, contract fraud, and mail theft.

**Method:** Regression

**Data Type:** Structured, Text, Images

**Implementation Stage:** Fully deployed

**Developer:** In-House

**Level of Sophistication:** Lower

**Citation:** United States Postal Service, Office of Inspector General, Postal Service Injury Compensation Program (July 25, 2013), http://docplayer.net/802084-Inspector-general-united-states-postal-service.html (noting, at page 12, use of "predictive models" and "sophisticated algorithms" to predict fraud and mail theft within agency's Risk Assessment Data Repository)

## Use Case #155

**Agency:** United States Postal Service

**Subagency:** N/A

**Policy Area:** Communications

**Task:** Public services and engagement

**Task Description:** To explore the possibility of launching a fleet of autonomous vehicles that will deliver mail, sort it, etc.

**Method:** Data Unavailable

**Data Type:** Structured, Text, Images

**Implementation Stage:** Planning

**Developer:** Non-Commercial Collaboration

**Level of Sophistication:** Insufficient detail

**Citation:** United States Postal Service, Office of Inspector General, Autonomous Vehicles for the Postal Service (Oct. 2, 2017), https://www.uspsoig.gov/sites/default/files/document-library-files/2017/RARC-WP-18-001.pdf (noting research and testing of autonomous systems for last-mile and long-haul delivery)

## Use Case #156

**Agency:** United States Postal Service

**Subagency:** N/A

**Policy Area:** Communications

**Task:** Public services and engagement, Internal management

**Task Description:** To determine risk of fraud and comparative market value in lease contracts of facilities

**Method:** Regression

**Data Type:** Structured, Text

**Implementation Stage:** Fully deployed

**Developer:** Commercial Contractor

**Level of Sophistication:** Insufficient detail

**Citation:** Elder Research, Case Study: Prioritizing Building Lease Renewal for Highest Potential Savings (2016), https://cdn2.hubspot.net/hubfs/2176909/Resources/Elder-Research-Case-Study-Lease-Renewal-Risk-Model-USPS-OIG.pdf (noting collaboration to develop tool using a "predictive model")

## Use Case #157

**Agency:** United States Postal Service

**Subagency:** N/A

**Policy Area:** Communications

**Task:** Public services and engagement

**Task Description:** To forecast demand and delivery costs and communicate pricing and delivery options to customers

**Method:** Data Unavailable

**Data Type:** Structured, Text

**Implementation Stage:** Planning

**Developer:** In-House

**Level of Sophistication:** Insufficient detail

**Citation:** United States Postal Service, Office of Inspector General, Coordination and Optimization Technologies and Postal Applications (Sept. 6, 2018), https://www.uspsoig.gov/sites/default/files/document-library-files/2018/RARC-WP-18-014.pdf (noting, at pages 13-14, use of predictive analytics and a chatbot technology)