

# Andrew M. Maloney

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## Education

**Iowa State University, Ames, IA**

Major: Mathematics

Certificate: Data Science

**Graduation Date: May 2020**

**GPA: 3.56/4.00**

**Iowa State University, Ames, IA**

Graduate Studies: Statistics

**August 2020 - Present**

(part-time)

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## Introduction

With formal education and work experience I integrate extensive mathematical, statistical, software programming, business, and economic skills with hands on practical application. I am analytical, inquisitive, disciplined, and an effective written and oral communicator. My technical skills and my relevant work experience are summarized below.

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## Technical Skills

- Strong Analytical – Critical Thinking Skills
- Mathematics: Linear Algebra, Calculus, Graph Theory
- Statistics: Classification, Regression, Time-Series Analysis, Geostatistics, Bayesian Inference, Statistical Inference, Statistical Methods
- Business Disciplines: Economics, Econometrics, Finance
- Broad Understanding of Data Structures and Algorithms
- Programming Languages: Python, R, MATLAB, SQL, GUSEK, Octave, C, CSS, HTML
- Network Services: Linux, Ubuntu, Secure Shell, Slurm Workload Manager/ Batch Scripts Job Scheduler
- Interfaces: Google Cloud API, TensorFlow API, Keras API, ArcGIS
- Software: JMP Statistics, Microsoft Excel

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## Relevant Work Experience

**Iowa State University in collaboration with**

**Center for Statistics and Applications in Forensic Evidence (CSAFE)**

*Ames, Iowa*

*Data Scientist – Research Assistant*

**May 2021 - Present**

**20 Hours / Week**

- Lead all team meetings and briefings with CSAFE management.
- Analyzed 3D topographical data utilizing multiple algorithms to include residual networks, fully connected neural networks, and U-Net for image segmentation as well as applying objective function optimization techniques and hyperparameter tuning.
- Continually assessed veracity of performance addressing reliability, maintainability, and repeatability.
- Implemented new data processing techniques for data pipeline to include Moore's Neighbor Contour Tracing Algorithm and Boundary Flood Fill Algorithm for correcting human labeling errors in 3D topographical data masks.

## **Data Science for the Public Good (DSPG)**

Ames, IA

**May 2021 - August 2021**

10 Hours / Week

### *Data Scientist*

- Selected to participate in three-month program utilizing data analysis to advance economic stability and mobility across Iowa. Utilized mathematical, econometric, and programming tools.
- Worked as a programming instructor and teaching assistant answering questions regarding computer programming, Git version control system, analytical techniques, database curating, database visualizations, web scraping, and web app development.
- Worked in designing web scraping functions for multiple stakeholders associated with the Data Science for the Public Good program with an emphasis on further data pipeline development.
- Handled any issues related to computer technology and programming languages such as: debugging code, programming efficiency, program optimization, primarily in R, Python, Windows, and MacOS.

## **Iowa State University in collaboration with Center for Statistics and Applications in Forensic Evidence (CSAFE)**

**September 2020 – April 2021**

20 Hours / Week

Ames, Iowa

### *Data Scientist – Research Assistant*

- Accepted as graduate research assistant. Area of research focused on developing artificial intelligence and programming tools for analysis of forensic ballistic data utilizing millions of ammunition data points.
- Lead all team meetings and briefings with CSAFE management.
- Developed research objectives and approach for CSAFE management approval. Approved October 2020.
- Routinely researched and applied internal CSAFE business and technical processes, as well as open access publications applicable to area of research, to formulate test strategy and identify limits and required constraints.
- Designed a complete data processing pipeline used for the analysis of 3D topographical data. Pipeline included a matrix cropping function, scripts used for missing value interpolations, and multi-dimensional tensor processing scripts used for feeding data into deep learning models.
- Analyzed multi classification (7 classes) performance of 3D convolutional neural networks on 3D topographical data. Continually assessed veracity of performance to include reliability, maintainability, and repeatability, and corrected scripts when errors were detected. Wrote results of this analysis, “Assessing 3D Topographical Data Labeling Using Convolutional Neural Networks”, documenting the exploration of multiple hyper parameters and the successful execution of this predictive model. Presented results to the Iowa State University Graphics Group.

## **Data Science for the Public Good (DSPG)**

Ames, IA

**May 2020 - August 2020**

40 Hours / Week

### *Data Scientist collaborating with the Bill & Melinda Gates Foundation*

- Competitively selected to participate in three-month program utilizing data analysis to advance economic stability and mobility across Iowa, Virginia, and Oregon. Utilized mathematical, econometric, and programming tools.
- Worked in designing a speech-to-text data processing pipeline used as the backend for applications in Python and R employing sentiment analysis.
- Worked in designing a R Shiny data analysis application for Iowa Hotline Outreach services, to include incorporating interpretable visualizations.
- Worked in designing applications that identify, web-scrape, and spatially map publicly available data reflecting formal and informal ‘Systems of Care’ for public civilian use.
- Large contributor in creating mass publicly available dataset known as DSPG <https://dspg-isu.github.io/DSPG/>
- Invited by local Ames, IA firm to present information on developed recommendations.

**Iowa State University in collaboration with:**  
**Center for Statistics and Applications in Forensic Evidence (CSAFE)**  
*Ames, Iowa*

**September 2019 – April 2020**  
20 Hours / Week  
**May 2019 – August 2019**  
40 Hours / Week

***Data Scientist – Research Assistant***

- Promoted from summer 2019 intern to undergraduate research assistant.
- Routinely reviewed publications or texts related to data analysis, statistical inference, optimization, visualization, modeling techniques, econometrics, mathematical programming, spatial data analysis, and multiple test and evaluation techniques.
- Analyzed curated data sets from National Institute of Science and Technology's (NIST) Ballistics Toolmark Research Database with the goal of ensuring that the data used by CSAFE is of the highest possible relevance and accuracy. Continuously scrutinized anomalous data.
- Assisted in the strategic development and testing of automated bullet matching algorithms for firearm examination.
- Wrote R Shiny scripts running a smoothing algorithm to identify and remove impressions from scanned bullet profiles on the backend while displaying the results to the user.
- Calculated and extracted features from scanned bullet profiles using the bulletxtctr R programming package.
- Assisted in debugging and maintaining multiple functions in the bulletxtctr R programming package.
- Used newly acquired features to refit random forest model that allows insight on the predicted probability of two bullet profiles being a match.

**Lynco Products**

*Milan, Illinois*

**May 2018 - August 2018**  
40 Hours / Week

*Warehouse / Information Technology Support - Internship*

- Used Excel, NAV, Python to analyze data and complete warehouse related tasks.
- Worked in groups/teams gathering, cleaning, and optimizing data on Universal Product codes for warehouse distribution.
- Assisted in developing a streamlined process for identifying and sorting company specific Universal Product Codes, provided recommendation to company president.

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**Iowa State University Student Project Experience**

**August 2016 – May 2020**

- Selected to compete in the annual Midwest Undergraduate Data Analytics Competition – March 2020.
- Selected to present at the 2019 Summer Undergraduate Research Symposium.
- Using machine learning models such as: Decision Trees, Random Forests, and Multi-Layer Perceptrons to correctly predict classification response variables for multiple kaggle datasets.
- Applied visualizations showing a comprehensive understanding of the grammar of graphics for statistical modeling.
- After analyzing and cleaning big data obtained from California Department of Transportation, trained combinations of Convolutional Neural Networks, Dense Neural Networks, and LSTM algorithms for regression analysis.

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**References**

Professional and Personal References Available Upon Request