Andrew Morgan

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Short Bio: I am a motivated, passionate, analytical data scientist, economist, and software developer. I graduated with a double major from the **University** **of** **Pittsburgh** in **Economics**-**Statistics** and **Computer** **Science**. My philosophy is to keep learning new skills and refining existing skills as business needs and technology rapidly change. Since the start of the Covid-19 pandemic, I have been unable to work because of caretaking responsibilities for my disabled mother (Multiple Sclerosis).

**Education**

**Bachelor of Science**: **Economics**-**Statistics** and **Computer** **Science**

University of Pittsburgh September 2015 – December 2019

* **Overall** **GPA** of **3.6**/4.0
* ***Magna Cum Laude***
* Economics-Statistics GPA of **3.7**/4.0
* Computer Science GPA of **3.6**/4.0
* Coursework: Software Engineering, Database Management, Statistical/Machine Learning, Artificial Intelligence, Stochastic Processes, Data Structures, Algorithms, *Expanded Section Page 4*

**Work Experience**

**Software Developer** and **Project Liaison**

Contractor for The Process Consultant, Pittsburgh, PA 05/2019 – 08/2019

* Developed CMS (web app) for client’s process documentation using **JavaScript, HTML/CSS, Ruby on Rails**.
* Automated process for migrating client’s data to new application using Python.
* Facilitated communication between senior management and the technical team.
* Delivered recommendations on technologies to be integrated within application.
* Enhanced user-interface allowing clients and users to easily upload and navigate content.

**Software Developer**, **Intern**

Imagine Careers, Pittsburgh, PA 05/2017 – 08/2017

* Developed web application like Glassdoor using **JavaScript (Angular v4), HTML/CSS, Git**.
* Created a dashboard view allowing users to modify account policies.
* Collaborated with team to improve search and filtering capabilities.
* Implemented feature to narrow user search results for more accurate results.

**Barista**, Crazy Mocha, Pittsburgh, PA 08/2016 – 10/2018

**Software Developer/Engineer Skills**

Programming Languages:

|  |  |  |
| --- | --- | --- |
| Python (Best/Preferred Language) | Java | Ruby |
| JavaScript | HTML | CSS |
| C | PHP (Familiar) |  |

Databases, Frameworks:

|  |  |
| --- | --- |
| Flask (Python) | SQL (PostgreSQL, Oracle DB) |
| Cypher (Graph Database Query Language) | Angular (TypeScript, JavaScript) |

Libraries:

|  |  |  |
| --- | --- | --- |
| jQuery (JavaScript) | SQL-Alchemy (Python, ORM) | Gunicorn (Python App Server) |
| PyTest (Unit-Testing Python) | Alembic (Database Migration) |  |

Software:

|  |  |  |
| --- | --- | --- |
| Unix/Linux | Heroku | Excel |
| Git (GitHub, GitLab) | STATA | Minitab |
| Virtual Machines (Hyper-V) | Tableau | JetBrains (IDE) |
| Visual Studio (IDE) | Eclipse (IDE) | Atom (IDE) |

Other Software Developer/Engineer Skills:

|  |  |
| --- | --- |
| Software Design Lifecycle (SDLC) | Test-Driven Development |
| Agile Development | AJAX Web Applications |
| Full-Stack Development (Personal Website) | Quality Assurance, Automated/Unit Testing |
| Database Management (SQL) | Front End Development |
| REST APIs | Content Management System (CMS) |

**Data Scientist and Statistician Skills**

Programming Languages and Tools:

|  |  |  |
| --- | --- | --- |
| Python (Anaconda Dist.) | R | MATLAB |
| Minitab | STATA | Microsoft Excel |
| Tableau |  |  |

Data Analysis Skills + Methods:

|  |  |
| --- | --- |
| Multiple Linear Regression | Statistical Learning |
| Bootstrap (Cross-Validation) | Ensemble Methods (Random Forest, Boosting) |
| Time Series Analysis | Convolutional Neural Networks |
| Stochastic Processes | Support Vector Machines |
| Linear/Quadratic Discriminant Analysis | Unsupervised Clustering (KNN, K-Means) |
| Dimension Reducing Methods | Agent-Based Modeling |
| Bias-Variance Tradeoff |  |

Python Libraries:

|  |  |  |
| --- | --- | --- |
| Pandas | NumPy | PyTest (Unit-Testing) |
| Scikit-Learn | Matplotlib |  |

R Libraries:

|  |  |
| --- | --- |
| Tidyverse (Data Tidying) | Astsa (Time Series Analysis) |
| Gbm (Generalized Boosted Models) | Dplyr (Data Management) |
| GGPlot (Plotting and Graphing) | Boot (Bootstrap Resampling) |
| RandomForest (Random Forest Modeling) | Gam (Generalized Additive Modeling) |

**Coursework**

Computer Science:

|  |  |
| --- | --- |
| Software Engineering | Artificial Intelligence |
| Computer Vision | Data Science |
| Software Quality Assurance | Database Management Systems |
| Data Structures | Algorithm Implementation |
| Systems Software | Operating Systems |
| Formal Methods in Computer Science | Discrete Structures |
| Web Application Design |  |

Statistics:

|  |  |
| --- | --- |
| Statistical Learning | Applied Time Series |
| Multiple Linear Regression | Mathematical Probability |
| Stochastic Processes | Mathematical Statistics |
| Principles of Data Science |  |

Economics:

|  |  |
| --- | --- |
| Seminar in Market Manias, Panics, Crashes | Intermediate Macroeconomics |
| Public Economics | Intermediate Microeconomics |
| Game Theory | Econometrics |

**Personal Programming Projects + Applications**

**Project Status Key:**

**Continuous**: A project or work that is long-term and ongoing. These projects often are designed to never really finish, but to have continual updates of content and improvements to functions.

**Completed**: A project or work that is completed with no plans for future additions to it. Bug fixing will continue, but the changes should be very minimal.

**Maintaining/Maintenance Phase**: A project or work that is released in a stable/acceptable condition, however future additions or changes to content may occur. Potentially, a project or work may have future planning and designing for future functionality or content.

**Current:** A project or work that is currently being built, developed, analyzed, or planned (depending on the details of either software, economic analysis, or statistical analysis). There should be at most 3 projects that are considered current at a given time.

**Future:** Primitive state for a project or work. There has been some planning, but the planning is not finalized. The project/work is not being worked on.

[**Personal Website and Portfolio**](https://andrew-morgan-website.herokuapp.com/) July 2020 – Present (Continuous Project)

<https://andrew-morgan-website.herokuapp.com/>

* Developing personal website to display my portfolio of current and past projects.
* Integrating personal and group projects from before and after university.
* Designing simple, responsive, yet attractive user interface.
* Developed with **Python** (**Flask**), **PostgreSQL**, **JavaScript**, **jQuery**, **AJAX**, **Bootstrap**, CSS, HTML, and **Heroku**.
* Components of Website:
  + My resume, CV, and introduction to who I am and what I am interested in.
  + Exhibits personal projects from academic blog posts (typically focused on economic theory) to a simple Sudoku Solver to CRUD (Create, Read, Update, Delete) applications like my Website Tracker App and CraigVersity.
  + A repository to track and display my progress as I improve my ability and skills.

**[Website Metadata Tracker Application](https://andrew-morgan-website.herokuapp.com/website-tracker/)** Jan 2021 ­– Present (Maintenance Phase)

<https://andrew-morgan-website.herokuapp.com/website-tracker/>

* Designed application to track website’s metadata, bug reports, feature requests, users, and content updates.
* Integrated bug reporting system into Navbar for easy bug documentation throughout site.
* Implemented user authentication system allowing users to create, edit, and request bug reports and features.
* Maintaining application and correcting bugs found, while designing future functionality.
* Developed with **Python** (**Flask**), **PostgreSQL**, **JavaScript**, HTML, and CSS.

**Personal Programming Projects + Applications CONT.**

[**Sudoku Solver**](https://andrew-morgan-website.herokuapp.com/programming-repo/sudoku-solver) June 2021 (Completed Project)

<https://andrew-morgan-website.herokuapp.com/programming-repo/sudoku-solver>

* Built and designed program to solve N by N Sudoku puzzles (like 9x9, 6x6, or 12x12 puzzles).
* Optimized performance by 95% after implementing searching heuristics and inferencing.
* Deployed program to my website with enhanced UI for Sudoku puzzle formatting.
* Built using **Python**, **JavaScript**, **jQuery**, **AJAX**, CSS, HTML

[**Agent-Based Modeling**](https://andrew-morgan-website.herokuapp.com/agent-based-modeling/abm-home) 06/2021 – Present (Current Project)

<https://andrew-morgan-website.herokuapp.com/agent-based-modeling>

* Agent-based modeling creates a system of many independent, autonomous agents that decide on actions based on their perceptions, often helping to understand the resulting system-level, macro-level trends.
* Capturing macro-level phenomena by simulating the interactions of individual, autonomous agents.
* Constructing a composition-based models to simulate different systems with parameters to analyze.
* Implemented the Schelling Segregation and Forest Fire models with editable parameters.
* Integrating into my website with trend analyses and visualizations using **JavaScript** and **Python**.
* Learning by applying skillset of economics, statistics, and programming to new domain of problems.
* Developing with **Python** for logic and **JavaScript**, **jQuery**, HTML, CSS for visualization.

[**Academic Blog Post Management System**](https://andrew-morgan-website.herokuapp.com/my-posts/)Future Project(Planning Phase)

<https://andrew-morgan-website.herokuapp.com/my-posts/>

* **Basic features implemented by September 2021. (Depends on website migration to Django)**
* Designing simple, lightweight content management system for my academic blog posts.
* Implementing a blog post content tracker to manage web page content, asset location, and searchability.
* Future features include user authentication system for commenting and liking/disliking posts, REST API for functionality, generating HTML page for specified post, filtering and searching through my posts easily (Elasticsearch potentially).

**School Programming Projects + Applications**

**[CraigVersity Application](https://andrew-morgan-website.herokuapp.com/craigversity)** Sept 2019 – Dec 2019 (Completed Project)

<https://andrew-morgan-website.herokuapp.com/craigversity>

* Led 4 other classmates in software engineering project as lead programmer.
* Deployed prototype of application like Craigslist, a place for bringing sellers and buyers together.
* Documented project following the **waterfall** **software design lifecycle** (SDLC).
* Developed with **Python** (**Flask**), SQLite3/**PostgreSQL**, **JavaScript**, HTML, and CSS.

**[Data Analysis of the Human Freedom Index](https://andrew-morgan-website.herokuapp.com/my-posts/posts/3)**  Jan 2019 – May 2019 (Completed)

<https://andrew-morgan-website.herokuapp.com/my-posts/posts/3>

* Analyzed large, high dimensional dataset quantifying human freedom with 5 classmates using **R**.
* Performed statistical methods with **R** including linear regression, QDA, LDA, dimension reduction, random forest.
* Performed data analysis, wrote reports detailing findings, and presented results as team.
* Identified most significant variables affecting the country’s human freedom with **statistical/machine learning**.

**Convolutional Neural Network Classifier** Completed Project

* Built neural network utilizing transfer learning with **AlexNet** within **MATLAB** classifying scenery in images.
* Improved classifier results from 30% to 75% with CNN and transfer learning.
* Designed a small, 3-layered CNN with specified activation functions.

**Coffee House Database Management System** Completed Project

* Designed database system for hypothetical chain coffee shop in team of 5 in the database course.
* Implemented successful command-line application using **Java** and **Oracle** to follow **ACID** principles.
* Ensured concurrency issues were discovered and resolved without leading to data inconsistency.

**Ruby Rush TDD Project** Completed Project

* Created a game where the player tries to mine the most rubies in a specified timeframe.
* Followed test-driven development techniques to ensure high unit test coverage in **Ruby**.
* Automated testing with Minitest (**unit**-**testing**) and SimpleCov (**code** **coverage**).

**Written Academic-Styled and Blog-Styled Papers and Posts**

[**The Overview of the 2008 Housing Bubble and Aftermath**](https://andrew-morgan-website.herokuapp.com/my-posts/posts/2)

<https://andrew-morgan-website.herokuapp.com/my-posts/posts/2>

* Explored the primary reason for the 2008 housing crisis and preceding mania.
* Studied how irrational exuberance created the foundation of the mania.
* Explained how the leveraged investment banks caused a financial blackhole when the panic set in.

[**Study of the USA’s Increasing Human Capital Throughout the 20th Century**](https://andrew-morgan-website.herokuapp.com/my-posts/posts/1)

<https://andrew-morgan-website.herokuapp.com/my-posts/posts/1>

* Highlighted the trends of schooling throughout the 20th century within the United States.
* Analyzed how the growing human capital from increased schooling affected the economy.
* Explained the reason individuals pursued high school and university instead of immediate work.

**[Summary of Data Analysis of the Human Freedom Index](https://andrew-morgan-website.herokuapp.com/my-posts/posts/3)**

<https://andrew-morgan-website.herokuapp.com/my-posts/posts/3>

* Analyzed a large, high dimensional dataset measuring human freedom with a team of 5.
* Performed statistical methods with **R** including linear regression, QDA, LDA, dimension reduction, random forest.
* Performed data analysis, wrote reports detailing findings, and presented as team to class these findings and insights.
* Identified most significant variables affecting the country’s human freedom with **statistical/machine learning**.

[**Analysis of Education on Economic Metrics**](https://andrew-morgan-website.herokuapp.com/my-posts/collection/education-and-economics)

<https://andrew-morgan-website.herokuapp.com/my-posts/collection/education-and-economics>

* Ongoing collection of my academic blog posts relating to education and economic metrics.
* Analyzing various datasets surrounding education, quality of life metrics, income, wealth, etc.
* Writing academic blog posts detailing findings from my analysis and research of other papers.