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. I have been unable to work since the beginning of the Covid-19 pandemic because of caretaking responsibilities for my disabled mother (Multiple Sclerosis) and recovery of a torn labrum surgery (shoulder).

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

Front End Developer and **Project Liaison**

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

- Automated process for migrating client's data to new application.
- 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.

Front End Developer, **Intern**

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

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

Statistics:

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

Economics:

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

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

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

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

06/2021 – Present (Current Project)

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

- **Content not yet released on website or GitHub. Should be ready by August 2021.**
- 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 framework 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

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

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

Jan 2019 – May 2019 (Completed)

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

- Analyzed a large, high dimensional dataset quantifying human freedom with a team of 5 classmates.
- 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

- 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

- 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

- 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

- 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.