Kevin Berry

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Education

Georgia Institute of Technology, *Atlanta, GA*, expected December 2018
Candidate for Bachelor of Science in Computer Science
Concentrations: Intelligence, Modeling and Simulation
GPA: 3.96/4.0

Coursework

Machine Learning, Computer Vision, Computational Science and Engineering Algorithms, Automata and Complexity, Compilers and Interpreters, Probability and Statistics, Combinatorics, Linear Algebra, Ordinary Differential Equations, Intro to Robotics and Perception, Computer Graphics

Computer Skills

Languages: **Python, C, Java, JavaScript and HTML, Haskell, Go, Rust**
Software and Tools: Scikit, PyTorch, Keras, Tensorflow, JuPyter, Pandas, Git, Linux, IntelliJ, Antlr, Vim, LaTeX

Experience

Machine Learning Engineer, Worthix June 2017 - Present
Worthix, Alpharetta, Georgia

- Designed, implemented, and deployed an easily extensible API for classification of multi-label documents from thousands of possible document classes
- Implemented a variety of deep learning models including Transformer networks, LSTMs, CNNs, as well as shallow models such as SVMs and Gradient Boosting
- Used meta-learning techniques such as curriculum learning, chained classifiers, AdaLIPO hyperparameter optimization, and cross-validated model selection
- Developed a testing workflow which permanently saves experimental configurations and results in a database to keep detailed records of model performance
- Worked with feature selection techniques such as document vectorization, fasttext word vectors, PCA, and explicit semantic analysis
- Designed and prototyped a multi-user online document tagging system to better scale training data creation for new industries and provide both correct answers and near-misses to classifiers

Teaching Assistant, Georgia Institute of Technology May 2016 - Present
CS 2110, Computer Organization and Programming

- Led recitations of 40-75 students with lectures and reviews of course material including C programming, RISC Assembly, CPU datapaths, and digital logic
- Graded assignments and wrote software to automate testing and grading of student Java programs and circuit diagrams

Database Administrator May 2015 - August 2016
Institute for Advanced Medical Research, Alpharetta, Georgia

- Conducted domain analysis and defined database entities in Dynamics CRM
- Wrote scripts to automate processes such as form entry and data reporting
- Trained clinical and administrative staff on the use of new CRM features
- Created a model to predict the ratio of patient leads to clinical trial stages

Selected Projects

Readability Analyzer January 2017 - July 2018

- Counts text features including sentences, characters, and syllables
- Uses an MLP regressor trained on over 130,000 English words to count syllables for out-of-vocabulary words
- Correctly predicts syllable counts for very long out-of-vocabulary words, e.g., supercalifragilisticexpialidocious (14 syllables), floccinaucinihilipilification (12 syllables), and pneumonoultramicroscopicsilicovolcanoconiosis (18 syllables), despite having only 2 training examples with more than 9 syllables

- Capable of analyzing large corpuses such as War and Peace in under 10 seconds
- Analyzes text by several metrics, including Flesch-Reading ease, the Gunning Fog Index, and others to produce an average text "grade level"

Ivan Allen Digital Archive User Interface September 2017 - May 2018
- Search interface, visualizations, and wiki-style transcription editing for the Ivan Allen Digital Archive, a document repository from the mayorship of Ivan Allen
- Uses an elasticsearch database to store document transcriptions
- Graph visualization allows for the visual design and use of boolean searches
- Used Tesseract OCR engine to extract text from over 10,000 scanned documents
- Used spaCy NLP to generate tags for connecting nodes in document graph

Clapchat March 2018 - April 2018
- Command line app that takes a picture when a user claps (or snaps)
- Convolves a Gaussian kernel over audio signal to identify claps
- Achieves 77% accuracy in clap identification when tested on a hand-made dataset of 350 miscellaneous noises and 350 claps

Minimum Vertex Cover Algorithms November 2017 - December 2017
- One branch and bound, two local search, and four approximation algorithms for minimum vertex cover NP-Complete problem
- Evaluates runtime and relative error of each algorithm on 11 real-world datasets with up to 14,000 vertices and 98,000 edges
- Proposed and evaluated a novel greedy approximation algorithm which achieves smaller vertex cover sizes and significant time reductions over the state of the art Fast VC algorithm on 10 out of 11 tested datasets

Differential Equation Graphing Calculator October 2017
- Graphs slope and direction fields of arbitrary single differential equations and systems of autonomous differential equations
- Plots approximate solutions to differential equations using Euler's method, Improved Euler's method, or 4th order Runge-Kutta methods
- Graphs component plots for arbitrary differential equations and systems

LC3 Simulator March 2017
- 2-pass assembler, disassembler, and simulator for the LC3 (Little Computer 3)
- Includes implementations of all LC3 trap instructions except PUTSP

Java REPL January 2017
- Parses, compiles, and evaluates Java methods against test cases in real time
- GUI includes code editor, compiler output, and method selection pane

Computer Algebra System Summer 2015 - Summer 2016
- Parses, simplifies, and evaluates real number, vector, and matrix expressions
- Evaluates algebraic functions, symbolic derivatives, and matrix operations

Extracurricular Activities

The Agency at Georgia Tech *(Communications Officer)*
- Gave a talk on semi-supervised and multitask learning
- Designed and put up posters for Agency talks and events
- Wrote GPS, LIDAR, and launch functions for an autonomous car
- Attended talks on deep learning, language processing, and computer vision

Theory Club at Georgia Tech *(Communications Officer)*
- Gave a talk on secure cryptography, with detailed explanations of AES, SHA-3, and Diffie-Hellman-Merkle key exchange
- Gave a talk on Turing completeness and surprisingly Turing complete programs
- Designed and put up posters for Theory Club talks and events
- Provided technical assistance to attendees of TensorFlow workshop
- Attended talks on computational complexity, cryptography, and game theory