Derrick Wigglesworth

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SKILLS

PROGRAMMING

Python and Jupyter
iPython Notebook
SQL
tensorflow, openCV
pandas, scikitlearn
nltk, numpy

MACHINE LEARNING

Natural Language Processing, tf-idf
Neural Networks, Gradient Descent
Naive Bayes (w/ smoothing)
Support Vector Machines
K-means Clustering
Q-Learning, Regression
Linear Programming
Backtracking
Hidden Markov
likelihood weighting
CNF & Inference by resolution

LINKS

Github:// **drwiggle**
LinkedIn:// **drwiggle**

EDUCATION

DATA SCIENCE

Online Courses

- CS50: AI with Python
- Relational Databases & SQL

PHD, MATHEMATICS

University of Utah
May 2018 | Salt Lake City, UT
Thesis: The geometry of Out(F_n) through completely split train tracks

BS, MATHEMATICS
BS, PHYSICS

University of Maryland
May 2012 | College Park, MD
Magna Cum Laude

PROJECTS

QUESTION ANSWERING | Created NLP AI to answer queries

- AI searches a corpus for the most relevant passages to answer query.
- Implemented tokenization to parse corpus of documents.
- TF-IDF method to determine most relevant documents, then TF to identify most relevant passage within said documents.

IMAGE CLASSIFIER | Designed DNN to categorize images

- Devised a deep neural network using TensorFlow to classify road signs from the German Traffic Sign Recognition Benchmark (GTSRB) dataset.
- Using tensorflow, I implemented a combination of convolutions, pooling, batch normalization, and dropout within the neural network, which was trained using a stochastic gradient descent algorithm (adam).
- Model can achieve accuracy of $97 - 98\%$ on the testing dataset in a short amount of time using modest computing capacity.

EXPERIENCE

UNIVERSITY OF ARKANSAS | Visiting Assistant Professor

Jan 2019 – Aug 2021 | Fayetteville, AR

- Orchestrated and taught several classes each semester with minimal supervision:
  - Cultivated relationships with students in class and office hours.
  - Prepared and graded course materials, including lectures, handouts, worksheets, homework, projects, tests, and quizzes.
  - Employed novel pedagogical tools (e.g., standards based grading, flipped classroom, extensive groupwork, and Python projects) to enhance student experience and learning.
- Service to department:
  - Supervised undergraduate research on graph theory.
  - Volunteered with Math Olympiad for Elementary and Middle School students.
- Continuation of research in geometric group theory (details below).

THE FIELDS INSTITUTE | Postdoctoral Fellow

July 2018 – Jan 2019 | Toronto, Ontario, Canada

- Collaborated with colleagues to discover and quantify new phenomena concerning the geometric structure of groups, using techniques from geometry, topology, and dynamics.
- Co-authored research papers to be published in high quality journals.
- Presented research at local, national, and international conferences.

UNIVERSITY OF UTAH | Graduate Teaching Assistant

Aug 2012 – May 2018 | Salt Lake City, UT

- Taught undergraduate courses each semester, including calculus (I, II, and III), linear algebra, discrete mathematics, trigonometry, quantitative reasoning.
- Served on department & scholarship committees, and mentored younger graduate students in their teaching/research.
- Organized and executed orientation and pedagogical workshops for incoming graduate students.