Derrick Wigglesworth

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SKILLS

PROGRAMMING

Python | Jupyter | SQL | tensorflow | openCV | pandas | scikitlearn | nltk | numpy | matplotlib

MACHINE LEARNING

Natural Language Processing
Neural Networks
Naive Bayes (w/ smoothing)
Support Vector Machines
K-means Clustering
Q-Learning, Regression
Linear Programming
Backtracking
Hidden Markov

AWARDS

- **Outstanding Grad Student Award**, 2017.
- **Outstanding Senior Award**, 2012.
- **Higginbotham Award**, 2011.

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

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: a difficult dataset with 43 classification categories.
- After applying image enhancement techniques, I implemented a combination of convolutions, pooling, batch normalization, and dropout within the neural network, which was trained using a stochastic gradient descent algorithm.
- Model achieves accuracy of $97-98\%$ (top decile of competition submissions) on the testing dataset in a short amount of time using modest computing capacity.
- Employed statistical tests to systematically tune hyperparameters, increasing model accuracy above 98%.

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.

EXPERIENCE

UNIVERSITY OF ARKANSAS | VISITING ASSISTANT PROFESSOR

Jan 2019 – Aug 2021 | Fayetteville, AR

- Taught several classes each semester with minimal supervision. Responsibilities included: cultivating relationships with students in class and office hours; preparing and grading course materials, including lectures, handouts, worksheets, homework, projects, tests, and quizzes.
- Employed innovative pedagogical tools (e.g., standards based grading, flipped classroom, extensive groupwork, and Python projects) to enhance student experience and learning.
- Service to department/community: supervised undergraduate research projects on graph theory and cryptography; volunteered with Math Olympiad for Elementary and Middle School students; referee research papers by assessing their accuracy/rigor and potential impact to the community, providing detailed feedback and recommendations for/against acceptance in high-quality journals.
- Performed research in the field of geometric group theory, often utilizing computational tools to explore novel phenomena (more details below).
- Experience communicating complex material to audiences from a wide variety of technical backgrounds.

THE FIELDS INSTITUTE | POSTDOCTORAL FELLOW

July 2018 – Jan 2019 | Toronto, Ontario, Canada

- Identified high-impact research opportunities to improve existing understanding of the geometric structure of groups; collaborated with colleagues to explore and explain novel phenomena using techniques from geometry, topology, and dynamics.
- Co-authored research papers to be published in top-tier journals and presented research at local, national, and international conferences.
- Quickly integrated new ideas into my existing toolset, then implemented them to advance research goals.