Kyle Otstot

CONTACT INFORMATION

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SUMMARY

- A fourth year honors student at ASU, studying computer science at the Master's level and conducting research in deep learning model robustness. Has experience in a range of ML fields– including computer vision, NLP, recommender systems, and time-series forecasting– through research, coursework, and personal projects.

EDUCATION

Arizona State University, Tempe, AZ   Fall 2019–Spring 2023 (expected)

- M.S. in Computer Science, GPA: **4.0** – via 21 credits. (*Graduating Spring 2023*)

- B.S. in Computer Science, GPA: **4.0** – via 50 credits. (*Fall 2019 - Spring 2022*)

- B.S. in Mathematics, GPA: **4.0** – via 51 credits. (*Fall 2019 - Spring 2022*)

- Barrett, the Honors College – Thesis: *A Graph-Based Machine Learning Approach to Realistic Traffic Volume Generation*

EXPERIENCE

- **Graduate Research Assistant**   August 2022–present
  School of Electrical, Computing, and Energy Engineering; Arizona State University

  - Supervised by Dr. Lalitha Sankar of ASU's Sankar Lab.
  - Focused on the use of alternative objective functions for generative adversarial network (GAN) training in order to help stabilize model convergence and lessen the network's performance dependency on random weight initializations.
  - Implemented PyTorch experiments on the benchmark *Stacked MNIST* and *Celeb-A* image datasets with deep convolutional generative adversarial nets (DCGANs), Adam optimization, and a variety of state-of-the-art objective functions.

- **Machine Learning Engineer**   June 2022–August 2022
  Wells Fargo (Contract)

  - Developed and trained a deep learning transformer model that classifies transaction data.
  - Designed and implemented a Python web-scraping technique to collect more information from brand names, using the BeautifulSoup library and AWS for IP rotation.
  - Created a visualization technique that combines the word-cloud algorithm with t-SNE clustering, designed to help ML practitioners visualize their text data for classification purposes.

- **Undergraduate Research Intern**   April 2021–July 2022
  School of Electrical, Computing, and Energy Engineering; Arizona State University

  - Supervised by Dr. Lalitha Sankar of ASU's Sankar Lab, and funded by *Summer Undergraduate Research Initiative* (SURI) and *Research Experience for Undergraduates* (REU).
  - Implemented experiments with PyTorch and ASU's shared cluster environment, using benchmark clean + corrupted datasets, deep residual architectures, state-of-the-art optimization techniques, and robust loss functions.
  - First authored *AugLoss: A Robust, Reliable Methodology for Real-World Corruptions*, one of 40 submissions accepted into the Principles of Distribution Shift workshop at the 2022 International Conference on Machine Learning (ICML).

- **Undergraduate Teaching Assistant**   August 2020–December 2021
  Fulton Schools of Engineering; Arizona State University

  - Worked as a TA for *Probability & Statistics for Engineers* (IEE 380) over three semesters.
  - Primary responsibilities included creating/presenting exam review, holding semi-weekly office hours, monitoring discussion boards, and proctoring exams.
  - Developed kotstot6.github.io/Hypothetest to help students with 2-sample hypothesis testing.

- **Instructional Aide**   March 2021–December 2021
  School of Mathematical & Statistical Sciences; Arizona State University

  - Worked for one *Calculus for Engineers II* (MAT 266) course, one *Elementary Linear Algebra* (MAT 242) course, and two *Math for Business Analysis* (MAT 211) courses.

- Primary responsibilities included holding office hours, as well as monitoring and answering questions on the discussion board.

- **Student Grader**   June 2021–December 2021
  Arizona State University

  - Graded for 7 *Discrete Math Structures* (MAT 243) courses over two semesters and 1 *Intro to Theoretical Computer Science* (CSE 355) course in Fall 2021.
  - Primary responsibilities included holding office hours, as well as grading recitations, homework assignments, and quizzes.

SKILLS
- **Deep Learning**

  - ***Libraries***: PyTorch, Tensorflow, NumPy.
  - ***Tasks***: Domain adaptation, Image classification, Image generation, Image deblurring, Image-to-image translation, Time-series forecasting, Text classification, Named entity recognition, Recommendation systems, Compressive sensing, Clustering, Dimesionality reduction.
  - ***Architectures***: Dense neural nets (MLPs), CNNs, Residual nets, U-Nets, RNNs (LSTMs, Bi-LSTMs), GANs, VAEs, RBMs, Text transformers (BERT, XLNet, GPT), Vision transformers (novice), Diffusion models (novice).

- **Machine Learning**

  - ***Libraries***: Scikit-Learn, NumPy, Pandas, Pyspark, SparkML, nltk, MATLAB built-ins.
  - ***Tasks***: Classification, Regression, Clustering, Association, Recommendation.
  - ***Models***: Linear regression, SVMs, KNN, Decision trees, Random forest, Gradient boosting (XGBoost, LightGBM, CatBoost), Naive Bayes, Matrix factorization, Content-based/collaborative filtering, PCA, SVD, K-Means, DBSCAN, Hierarchical clustering, t-SNE.

- **Data Mining**

  - ***Libraries***: BeautifulSoup, Selenium, requests, nltk, Pandas, Pyspark.
  - ***Tasks***: Community detection (CPM, Spectral, Modularity), Web ranking (Katz, PageRank), Association rule mining (Apriori), Data transformation (TF-IDF, Word2Vec, GloVe).

- **Data Visualization**

  - ***Libraries***: Matplotlib, Seaborn, D3.js, Leaflet.js, HighCharts.
  - ***Tools***: Tableau, Power BI.

- **Web Development**

  - ***Client***: HTML, CSS, JavaScript, Pyodide, MathJax.
  - ***Server***: PHP, SQL, MySQL (GCP, AWS), Node.js, Flask.

- **Miscellaneous**

  - ***Languages***: Python, Java, C/C++, MATLAB, Bash, Git.
  - An extensive mathematical background up to the undergraduate level, including advanced calculus, linear algebra, graph theory, and scientific computing.
  - Experience in academic writing, specifically with LaTeX.
  - Proficiency in research computing & shared cluster environments with SLURM.

PUBLICATIONS
- K. Otstot, J. K. Cava, T. Sypherd, and L. Sankar, "Augloss: A robust, reliable methodology for real-world corruptions," in *Principles of Distribution Shift*, 2022. [Online]. Available: https://drive.google.com/file/d/1d0ThUnVaGHbEXq6VskE9u8uxjnf6SJmI/view?usp=sharing

- K. Otstot, "A graph-based machine learning approach to realistic traffic volume generation." ASU KEEP Library, 2022. [Online]. Available: https://keep.lib.asu.edu/items/166729

PROJECTS
- See full project portfolio at https://kotstot6.github.io/#projects.

AWARDS
- **August 2022**: Awarded the 1st place prize of $7500 for winning the 2022 *Wells Fargo Campus Analytics Challenge*, a nationwide ML competition prompting college students to use state-of-the-art natural language processing (NLP) techniques to develop a transaction categorizer.

- **April 2022**: Selected to join ASU's chapter of *Phi Beta Kappa*, the nation's oldest and most prestigious honor society for the liberal arts and sciences.

- **April 2022**: Selected to attend the sixth annual *Wexler Mathematical Sciences Senior Dinner*.

- **December 2021**: Selected to receive the 2021-2022 *Dr. William E. Lewis Excellence in Computer Science Engineering Scholarship* with the approximate amount of $6199.