Allegra Allgeier

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Aspiring data scientist (US citizen) temporarily abroad combining professional growth with relocation for family reasons.

SKILLS

Programming Languages:	Python, SQL, MATLAB, R, Java
Tools:	PyTorch, pandas, scikit-learn, matplotlib, OpenCV, ONNX Runtime, git, bash, Docker
Concepts:	Data Science, Computer Vision, Deep Learning
Languages:	English, Japanese

EXPERIENCE

Researcher, Brain Co., Ltd. | Nishiwaki, Japan *Jan 2023 – present*

Assisted the development of commercial computer vision systems by Brain Co.

- Developed an instance segmentation data augmentation pipeline using OpenCV and a rectangle packing algorithm, improving the generation of an image and its masks from a manual rate of 7 to an automated 11300 images/hour.
- Increased the accuracy of a meal identification system from 85% to over 95% through identifying issues in the code.
- Implemented anomaly detection methods such as PatchCore, PaDim, and SPADE for potential use in food quality control.

Assisted a major Japanese construction firm in automating tunnel drilling.

- Visualized spatiotemporal data to show drill patterns, allowing the client to isolate select data for further analysis.
- Found a positive correlation between soil hardness and blast count, offering optimization insights for drilling strategy.
- Conducted a segmented data analysis by dividing the tunnel into six regions and calculating blast densities, revealing varying demands for, and informing the distribution of, blasts across regions.

Graduate Teaching Assistant, Georgia Institute of Technology | Atlanta, GA *Aug 2020 – Dec 2022*

- Assisted undergraduate students with Integral Calculus and Linear Algebra through recitations and office hours.
- Awarded Outstanding Student Evaluations by the School of Mathematics in April 2022.

Undergraduate Researcher, University of California, Berkeley | Berkeley, CA *Jun 2018 – Aug 2018*

- Researched and visualized hyperbolic polyhedra in Python during an REU in geometry and topology.
- Presented at the 2019 Nebraska Conference for Undergraduate Women in Mathematics and Kalamazoo College.

SELECTED PROJECTS

Convolutional Neural Networks

- Found that ResNet recognizes local patterns, instead of global object shapes, and exploit spurious correlations.
- Trained ResNet with transfer learning for object detection and performed data collection, cleaning, and annotation.
- Published the main article and a follow-up article through IEEE conferences in 2022.

Credit Card Fraud Detection

- Balanced data with SMOTE and reduced dimensionality by filtering through variance/correlation and by PCA/MCA.
- Applied logistic regression, KNN, naïve Bayes, SVM, and decision tree and compared them by recall and F1 scores.

Image Deblurring and Denoising

- Deblurred and denoised images through total variation minimization using FFT and conjugate gradient descent.

Computer Vision

- Matched features by implementing the Harris corner detector and a simplified SIFT; estimated the homography matrix for panorama stitching using RANSAC; and trained the PSPNet for semantic segmentation.

EDUCATION

Georgia Institute of Technology | Atlanta, GA *Dec 2022*
Master of Science in Electrical and Computer Engineering
Major GPA 4.00/4.00 – President's Fellowship

Kalamazoo College | Kalamazoo, MI *Jun 2019*
Bachelor of Arts in Mathematics
GPA 3.97/4.00 – Summa Cum Laude with Honors