# Shaashvat Shetty

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## Education

**B.S. Computer Science | B.S. Statistics** Expected May 2027
*University of Maryland, College Park*

GPA: 3.76 (CS Honors, Dean's List)

**Relevant Coursework:** Advanced Data Structures, Algorithms, Data Science & Machine Learning, Computer Systems, Statistical Computing with SAS, Applied Probability & Statistics

## Experience

**Research Assistant** August 2025 – Present
*University of Maryland, College Park — Advisor: Prof. Haizhao Yang*

- Contributing to research in symbolic machine learning to create interpretable AI by investigating the Finite Expression Method (FEX).
- The research aims to solve complex, high-dimensional partial integro-differential equations (PIDEs) by discovering explicit mathematical solutions, directly addressing the "black-box" problem of traditional neural networks.

**Software Engineering Intern** June 2024 – September 2024
*Juniper Networks, Sunnyvale, CA*

- Built a Python-based CLI tool that parses router configurations to automatically identify faulty EVPN-VXLAN connections, reducing manual debugging time from several hours to under 5 seconds. Previously, network engineers had to manually trace configuration files to isolate issues.
- Designed the tool to operate across complex multi-leaf and spine topologies with hundreds of nodes, ensuring reliable performance in production-scale deployments.
- Collaborated on a second CLI command that locates the exact cause of the faulty connection, such as interface misconfigurations or VLAN mismatches, significantly speeding up the process of identifying and resolving network issues.
- Created thorough architectural documentation and inline code comments to support long-term maintainability and ease onboarding for future engineers.

**Math Tutor** June 2022 – June 2023
*Mathnasium, Scotts Valley, CA*

- Tutored K–12 students in algebra, geometry, and calculus, enhancing comprehension and performance.
- Developed clear, concise instructional methods to communicate complex concepts.
- Cultivated leadership and mentoring skills through consistent one-on-one sessions.

**Computer Vision Intern** June 2022 – August 2022
*UCSC SIP, Santa Cruz, CA*

- Built a deep learning system for drone navigation using natural language commands, enabling the drone to visually identify and track objects based on text input.
- Implemented YOLOv3 for object detection after evaluating YOLOv5; YOLOv3 provided ∼35% faster inference on limited hardware while maintaining comparable accuracy across 60 object classes.
- Used cosine similarity in the NLP pipeline to support synonym flexibility in user commands (e.g., "bike" instead of "bicycle"), improving user experience without retraining.
- Integrated semantic segmentation to enhance scene understanding and reduce object misclassifications, enabling more reliable obstacle avoidance and path planning.

## Technical Skills

**Languages**: Python, C++, C, Java, JavaScript, OCaml, Rust, R, SAS, MATLAB, Bash, Assembly, SQL
**Developer Tools**: Git, GitHub, VS Code, Eclipse, Sublime, Jupyter Notebook, JUnit
**Libraries**: NumPy, Pandas, Matplotlib, scikit-learn, YOLOv3, PyTorch, TensorFlow, Keras
**Technologies**: Data Center Technology, EVPN-VXLAN, BGP protocols

## Projects

**Analysis of Various Classification Methods on the Fashion MNIST Dataset** | *May 2025*

- Evaluated seven distinct machine learning models, from traditional algorithms like SVM to a deep learning CNN, to determine the optimal algorithm for a comprehensive image classification analysis.
- Implemented a full model pipeline, applying Principal Component Analysis (PCA) for dimensionality reduction and 5-fold cross-validation to ensure model robustness and prevent overfitting.
- Engineered a Convolutional Neural Network (CNN) that achieved 91.05% accuracy, confirming its superior performance over traditional models through a detailed comparative analysis using confusion matrices.

**Map-Matching Algorithm Analysis** | *April 2025*

- Implemented four GPS map-matching algorithms and designed tests across dense urban and sparse rural environments.
- Developed synthetic GPS trajectory data with controlled noise to simulate real-world inaccuracies.
- Quantitatively analyzed error statistics, finding the Hidden Markov Model to be most accurate with mean error as low as 0.69m.