Yash Dagade

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Education

Duke University Durham, NC

B.S. in Mathematics and Computer Science (A.B. Duke Full-Ride Merit Scholar) *2024 – 2028* *GPA: 4.0*

- **Coursework:** MATH 501 Algebraic Structures I; MATH 403: Advanced Linear Algebra; MATH 221 Linear Algebra; MATH 281S Problem Solving Seminar; ECE 685D Intro to Deep Learning; ECE 689 Advanced Topics in Deep Learning; ECE 687D Theory & Algorithms of Machine Learning; COMPSCI 572 Natural Language Processing; THEATRST 242S The Art of Improvising.

* Duke: course number $\geq$ 500 indicates graduate-level.

University of Minnesota, Twin Cities Minneapolis, MN

Dual Enrollment (PSEO) *2022 – 2024* *GPA: 4.0*

- **Coursework:** CSCI 1133 Introduction to Programming Concepts; CSCI 2011 Discrete Structures; CSCI 1933 Introduction to Algorithms and Data Structures; CSCI 2041 Advanced Programming Principles (OCaml); CSCI 3003 Introduction to Computing in Biology; CSCI 4511W Introduction to Artificial Intelligence; CSCI 5521 Machine Learning Fundamentals; CSCI 5461 Functional Genomics, Systems Biology, and Bioinformatics; MATH 2373 Linear Algebra and Differential Equations; PHYS 1401V Honors Physics I (Top 10%); ME 3331 Thermodynamics; ME 3332 Fluid Mechanics.

* UMN: course number $\geq$ 5000 indicates graduate-level.

University of Oxford, New College Oxford, UK

Visiting Student (A.B. Duke Scholarship): Ethics and Philosophy of Artificial Intelligence *Summer 2025* *Grade: A–*

- **Coursework:** Ethics and Philosophy of Artificial Intelligence.

Experience

Researcher New York, NY

Computational Intelligence, Vision, and Robotics Lab at NYU *May 2025*

- Collobrated with Yilun Kuang, Tim Rudner, Randall Balestriero, Yann LeCun
- Worked on RectifiedLpJEPA, a controllable sparsity-based self-supervised learning method that trains models on maximum-entropy sparse representations, enabling highly sparse yet performant pretraining. See lpjepa.com for details.
- Worked on Radial-VCReg, a self-supervised learning method augmenting VICReg with a radial Gaussianization loss that transforms a broader class of feature distributions toward normality
- Presented at NeurIPS 2025 workshops: Symmetry and Geometry in Neural Representations and UniReps; poster.

Research Engineer — University of Minnesota, Twin Cities Minneapolis, MN

Flow Field Imaging Lab *2022 – 2024*

- Led development of SkyWindFarm, an airborne wind energy system; first author and inventor on a utility patent.
- Applied Reynolds–Averaged Navier–Stokes with SST k–ω turbulence modeling to optimize vertical-axis wind turbines, improving the coefficient of performance (C_p) as a function of tip-speed ratio (λ).
- Conducted 6-DoF CFD simulations on the Agate supercomputer at UMN MSI, wind tunnel experiments at the Akerman Hall wind tunnel, and outdoor flying-prototype field tests to design, validate, and advance the system to TRL 4.
- Won $30K+ in awards, including 3rd Place Grand Award at ISEF 2023 & 2024, $10,000 Special Prize (ISEF 2024), and Regeneron Science Talent Search 2024 Finalist. Check out: Project paper; prototype flight video; technical explanation.

Projects

ConnectU.ai *2025*

- Built ConnectU.ai, a mentor–mentee pairing platform; formulated matching as a constrained optimization problem and implemented matching via the Hungarian algorithm over embedding similarity.
- Deployed end-to-end on AWS using EKS, EC2, ECR, Route 53, ALB, ACM, HPA, and S3 with scalable Kubernetes-based infrastructure.

AI Systems for Distracted Driving Prevention *2022*

- Safer Route Planning Algorithm
  - Designed a momentum-based routing algorithm optimized over 3.1M+ accident records spanning 22 years of historical data from the Minnesota Department of Transportation to construct mathematically safer routes.
  - Deployed as a live route-planning system at idontwannadie.lol; demo video.
  - Won Best Use of Statistics and Best Community Impact awards at PennApps XXV.
- Eye Distraction Alertness (EyeDa) Device
  - Prototyped a real-time distracted-driving detection system and led a 15-person engineering team.
  - Presented at the Minnesota Towards Zero Deaths Conference to law enforcement and policymakers.
  - Media coverage: KARE11, CBS, Star Tribune; device video.

Other

Awards: Regeneron STS Scholar; YC AI SUS Hackathon — 1st Place; USNCO Qualifier (5th, MN); National Merit Scholar

Skills: Python, PyTorch, PyTorch Lightning,NumPy, Slurm, C/C++, JavaScript/TypeScript, React.js, Node.js, HTML/CSS, Java, SQL, MongoDB, Docker, Kubernetes, AWS, Julia, MATLAB, SolidWorks, Fusion 360, ANSYS Fluent.

Languages: English (Fluent), Hindi (Fluent), Love (Informally Proficient).

Interests: Philosophy (Nietzsche, Girard), Building and Understanding Intelligence, Mathematics, Rowing, Long-Distance Running.