ESHA PENMATSA

Computer Science · AI / ML Research · Technology + Business · Real-World Impact
eshapenmatsa@gmail.com · (984) 308-5030 · https://www.eshapenmatsa.com · Green Level High School, Cary, NC

GPA: 4.74 W / 3.97 UW | Class Rank: 24 / 576 (Top 4%) | ACT: 35 Composite

Aspiring Computer Science student, passionate about applying AI, technology, and research to solve real-world challenges. Driven by curiosity to turn questions into innovative solutions with meaningful impact.

AP Courses (13): AP Precalculus · AP Calculus AB · AP Calculus BC · AP Statistics · AP Physics C Mechanics · AP Computer Science Principles · AP Computer Science A · AP Environmental Science · AP English Literature & Composition · AP English Language & Composition · AP Psychology · AP Modern World History · AP U.S. Gov & Politics

Dual Enrollment: Wake Technical Community College — Business Core & Associate of Science Pathway

STEM – RESEARCH, LEADERSHIP & HONORS

Research

- **2026** – First Authored Independent Research with NCSU Faculty; Accepted & Presented at 2026 AIPR Workshop in Washington, DC. Full Paper submitted for publication.
- **2025** - NCSU Online Research Academy – Drone Delivery Research Student and Student Ambassador

Technology Student Association – Green Level HS

- **2026–Present:** TSA President, National Finalist (5th place – Audio Podcasting)
- **2025–2026:** Exec Board Member (Secretary); National Finalist (7th place – Audio Podcasting)

National Center of Women & IT (NCWIT)

- **2024–2026:** 3× NC Affiliate Winner - Aspirations in Computing High School Award

Technovation Girls - Global App Challenge

- **2026 –** Global Student Ambassador
- **2023–2026:** 4× Quarter-Finalist, **2022 –** Semi-Finalist

FIRST Robotics:

- **2023–Present:** FIRST Youth Mentor
- **2024** - FRC NC District Impact Award (Team 900)
- **2023** - FRC World Championship Qualifier (Team 3459)

SERVICE, ATHLETICS & ARTS

Presidential Service Award

- **2024** - Presidential Gold Award
- **2023** - Presidential Silver Award

National Honor Society – Active Member

- **2025-Present** - Green Level High School

Green Level Student Ambassador

- **2025-Present** - Green Level High School

National Academy of Engineering (NAE)

- **2024** Girls Writing Contest - National Finalist

Star Quest National Dance Competition (VPAC Academy)

- **2026**: National Qualifier (Nova Grp)
- **2023–2025: 3×** National Finalist (Nova Grp)

High School Varsity Tennis Player – Green Level High

- **2023–Present** – Varsity Team Player
- **2026** - Varsity Player & Social Media Manager
- **2025 & 2026** - Team won Quad City 7 Conference

Carnatic Vocal - Sampada Performing Arts Academy
(NAAC Accredited University)

- **2024 - Certified Level 3 (Senior Level)**
- **2021 - Certified Level 1 and Level 2 (Junior Level)**

RESEARCH EXPERIENCE

Independent Research — NC State University Faculty, Dr.Vatsavai **May 2024 – Present**
Geospatial AI Researcher, First Author

- Conducted independent geospatial AI research with NC State faculty and a Ph.D. researcher, benchmarking Prithvi and other foundation AI models on Sentinel-2 imagery and the CaBuAr dataset to identify wildfire burn areas from pre- and post-fire imagery and improve burned-area mapping.
- First-authored research accepted & presented at the Applied Imagery Pattern Recognition (AIPR) Workshop in Washington, DC. Full paper has since been submitted to the workshop proceedings. https://www.eshapenmatsa.com/aipr-26-abstract.pdf

NASA Ames Research Center — Aviation Systems Division **May 2026 – Aug 2026**
Concept Design Research Intern, Autonomous Wildfire Systems

- Designed a multi-tier autonomous system for early wildfire detection, integrating edge AI, remote sensing, and geospatial data to improve wildfire monitoring in remote areas.
- Co-authored a technical manuscript on a scalable wildfire detection system, **published** as NASA Technical Memorandum NASA/TM-20260007959 on the NASA Technical Reports Server (https://ntrs.nasa.gov/citations/20260007959).

MIT Beaver Works Summer Institute — Medlytics (Healthcare AI/ML) **July 2026 – Aug 2026**
ML Researcher, Parkinson's Tremor Classification

- Evaluated Random Forest, Logistic Regression, XGBoost, CNN, and LSTM models, analyzing tremor frequency and model performance.

- Tested machine-learning models to classify Parkinson's-related tremor patterns from smartwatch sensor data, explored whether tremor patterns could help distinguish Parkinson's from other neurodegenerative disorders, presented capstone project.

Independent Research — University of Wisconsin-Madison Faculty, Dr. Rudraraju **Jan 2025 – Present**

AI / Neural Networks Independent Study

- Pursued faculty-guided independent projects exploring biological neuron models (Hodgkin–Huxley), spiking and deep neural networks, machine learning, AGI, and agentic AI; implemented models and experiments in Python/scikit-learn.

LEADERSHIP & TECHNOLOGY

Technology Student Association (TSA) — Green Level High School **Aug 2024 – Present**

President (2026–Present); Secretary (2025–26);

- As President, led and organized a chapter of 40+ members through meetings, presentations, and chapter activities. Previously served as Secretary, maintaining attendance records and supporting chapter organization.

FIRST Robotics — Teams 900 Zebracorns & 3459 Pyrotech; FLL Teams 52419 & 32121 **Jun 2022 – Present**

Lead Programmer & Youth Mentor

- Contributed to FRC robot development across 2 competition teams, supporting programming, debugging, technical strategy, and competition preparation. Supported STEM outreach reaching 200+ students through camps and workshops (Girls Who Code, MakerCamp, Engineering Day)
- Mentored 2 FLL teams from prototyping through competition, designed rookie curriculum, helping younger students build confidence in programming, debugging, robot design, and problem-solving.

Technovation Girls — International STEM App Development Challenge (170+ Countries) **Sep 2022 – Present**

Global Student Ambassador (2026) & Competitor

- Over 5 years, developed 5 mobile and web applications addressing allergy safety, caregiving, women's empowerment, financial literacy, and sustainable recycling.
- As a Global Student Ambassador, collaborated with 100+ girls through STEM outreach and mentorship, sharing my experiences in Technovation and encouraging younger students to explore technology and entrepreneurship

INTERNSHIP & PROFESSIONAL EXPERIENCE

NC Department of Information Technology (NCDIT) **May 2025 – Aug 2025**

IT Business Analyst Intern (Paid) - First High School Student Hired

- Worked with the Business Analysis team on IT projects for North Carolina state agencies, gathering stakeholder needs, translating them into clear requirements, and presenting on AI integration to the BA team.
- Developed a Business Requirements Document (BRD) template to help Business Analysts gather and communicate client needs.

College Board Teamship — District C (NCSSM Showcase Selection) **Jan 2024 – Feb 2026**

Business Consulting Intern

- Completed six short-term consulting projects with startups and organizations across technology, accessibility, and marketing
- Contributed to projects including marketing the Daily Buddy app (QL Techworks), a client follow-up system (Oma Health), marketing and social media strategies (The Loading Dock), and developing a STEM enrichment lesson plan for Williams Racing

ATHLETICS, SERVICE & ARTS

Varsity Girls Tennis (Green Level High School) **Aug 2023 – Present**

Varsity Tennis Player (4 seasons); Social Media Manager (2026);

- Competed in varsity tennis for 4 seasons; managed social media in 2026 (300 followers) to promote the program to prospective members; completed 8+ years of Cary Tennis Park Academy clinic training.

Star Quest National Dance Competition — VPAC Academy, Nova Group **Jun 2022 – Present**

- Competed nationally with Nova Group through long-term training, teamwork, and performance preparation.

Student Ambassador & National Honor Society (Green Level High School) **Aug 2023 – Present**

Student Ambassador; NHS Active Member; Cary Teen Council - 200+ Volunteer Service Hours

- Represented Green Level's student community as a Student Ambassador, engaging new students through tours sharing firsthand perspectives on high school life; contributed to community service through Cary Teen Council & National Honor Society.

TECHNICAL SKILLS & PROGRAMS

Programming	Python, Java, JavaScript, HTML, CSS | **Frameworks:** ReactJS, Google Firebase, Google Colab
Certifications	Lean Six Sigma (2025) | Microsoft Excel Certified
Programs	Girls Who Code: ML/AI (2024), Cybersecurity (2024), Summer Immersion (2025)
Courses	MIT EdX: Understanding the World through Data | Harvard CS50: Understanding Technology
Hackathons	Duke Femmes+ Connect: Research (2025) | Duke Femmes+ Hacks: Cybersecurity (2024), Data Science AI (2023)