Avinash Nandyala

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EDUCATION

University of Massachusetts Amherst **Expected May 2026**
Master of Science, Computer Science *Amherst, Massachusetts*
- Coursework: Machine Learning, Reinforcement Learning, Robotics, Advanced Natural Language Processing

Indian Institute of Technology, Kharagpur (IIT Kharagpur) **May 2021**
Bachelor of Technology, Computer Science *Kharagpur, India*
- Coursework: Machine Learning, Deep Learning, Natural Language Processing, Image Processing, Database Management Systems, Computer Networks, Operating Systems, Theory of Computation, Formal Language and Automata Theory

EXPERIENCE

Mastercard **July 2021 – July 2024**
Software Engineer *Pune, India*
- Enhanced the Enhanced Currency Conversion (ECC) platform by developing scalable ASP.NET web pages and REST APIs, resulting in 35% faster transaction processing and 25% improvement in customer satisfaction scores.
- Optimized web-cookie handling across key administration portals, reducing session timeouts by 40% and improving security compliance by implementing robust encryption, leading to 0 security incidents.
- Implemented PCI Key Block mandate compliance for sensitive payment fields (CAVV, HMAC), achieving 100% compliance with industry standards and reducing encryption-related issues by 90%.
- Mentored 5 incoming interns in developing an Automated Environmental Stability Reporting tool, increasing system monitoring efficiency by 60% and reducing manual reporting time by 75%.
- Led successful migration of 15+ gateway services from Oracle Java 8 to Zulu 17, reducing system vulnerabilities by 80% and improving performance by 30%. Resolved 50+ build issues and eliminated 95% of critical security vulnerabilities in tokenization microservices.

Mastercard **August 2020 – April 2021**
Software Engineer Intern *Pune, India*
- Developed a simulation of an end-to-end Point of Sale (POS) machine for contactless card payments using C and Arduino WIFI Module, achieving a 30% increase in transaction speed and a 20% reduction in hardware costs.

RELEVANT PROJECTS

BioNLP Model Alignment using DeepSeek-RL | *BioNLP Lab* | *LLMs, Transfer Learning, Unsloth AI*
- Aligned large language models (Qwen, LLaMA) using DeepSeek-RL for biomedical NLP tasks.
- Evaluated performance on the MIMIC-EXT-IV clinical dataset and Rare dataset to benchmark accuracy across aligned models, achieving 85% accuracy with Reinforcement Learning from Human Feedback (RHLF) and 60% accuracy with Fine Tuning.
- Focused on improving domain-specific understanding and clinical coherence in model outputs.

Hierarchical Context Aggregation for Quality Automated Medical Notes | *LLMs Transfer Learning*
- Implemented spoken language normalization using hybrid rule-based and neural approaches, achieving 90% accuracy in medical terminology grounding.
- Developed key-phrase extraction and topic categorization algorithms using hierarchical clustering, enabling structured SOAP note generation from doctor-patient conversations.

Patrol Bot – Autonomous Security Robot | *ROS, OpenCV, Computer Vision*
- Developed an autonomous Patrol Bot on the Triton platform, integrating OpenCV-based vision for person detection, obstacle avoidance, and dynamic path planning for security patrol tasks.
- Designed and implemented a color-coded feedback system (red for person detection, yellow for static obstacles) and conducted real-world testing across varying object sizes and movement patterns.

Advanced Robot Navigation and Localization | *ROS, C++, Gazebo, Q-Learning, SARSA*
- Developed a particle filter algorithm for robot localization in indoor environments, achieving 0.5m position accuracy and 0.2 rad orientation accuracy within 50 iterations, while reducing computational complexity by 10% with an efficient likelihood field-based sensor model and motion model using Gaussian noise parameters.
- Implemented and compared Q-learning and SARSA algorithms for autonomous robot wall-following, achieving 6000+ J-value rewards and successful navigation across 5 diverse scenarios, with a 100% success rate in handling complex scenarios like L-shape corners and 180-degree turns through sophisticated state-action spaces and reward mechanisms.

MCTS, REINFORCE, and Actor-Critic on Four Mini-Games | *Reinforcement Learning*
- Implemented and evaluated these algorithms in 687-GridWorld, Acrobot, Cat vs Monsters, and Cliff Walking.
- Optimized neural networks and hyperparameters for effective policy learning and navigation.

Legal Judgment Classification | *TensorFlow, FastAPI, NLP*
- Developed a BiLSTM-BERT model to classify legal judgments using datasets from the Supreme Courts of India and the UK.
- Achieved an average F1-score of 0.6898 on the Indian dataset and 0.5542 on the UK dataset.

Hospital Recommender Ambulatory System | *Android Studio, Java, Python, Selenium, Google Maps API*
- Built an Android app to calculate patient Critical Index (CI) using linear regression and recommend hospitals within 5 km, scraping data from Google Maps API with Python Selenium.

TECHNICAL SKILLS

Languages: Python, C/C++, Java, C#, HTML, CSS, JavaScript, SQL, Shell Scripting
Developer Tools: Unsloth AI, PEFT, Qwen, LLaMA, Git, Maven, Gradle, Jenkins (CI/CD), IntelliJ, Android Studio, JMeter, Splunk
Frameworks: ROS, PyTorch, Selenium, ASP.NET, Spring Boot, Node.js
Databases: MySQL, PostgreSQL, MongoDB, Redis
Cloud: AWS Cloud, Docker, Kubernetes

ACHIEVEMENTS & EXTRACURRICULARS

- Awarded MVP (Most Valuable Player) at Mastercard in 2024 for most exceptional performance and contributions within team
- Secured All India Rank of 900 among 1.4 million applicants in Joint Entrance Examination - Advanced
- Volunteer, NSS – Community service: road construction, tree plantation, teaching English.