Khoshrav Doctor

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EDUCATION

University of Massachusetts Amherst **Expected Graduation: May 2026**
Ph.D. in Computer Science (GPA 3.95)
Laboratory for Perceptual Robotics

University of Massachusetts Amherst **Graduated: Feb 2020**
Master of Science in Computer Science (GPA 3.94)
Laboratory for Perceptual Robotics
Relevant Courses: Robotics, Reinforcement Learning, Machine Learning, Artificial Intelligence, Feedback Control Systems

K. J. Somaiya College of Engineering, Mumbai **Graduated: July 2016**
Bachelor of Engineering in Information Technology with First Class (GPA 7.1 out of 10)

WORK EXPERIENCE

Laboratory for Perceptual Robotics, UMass Amherst **Aug 2017 – Present**
Research Assistant

- Designed mechanisms for robots to autonomously model interaction dynamics of multimodal stimuli when presented with novelty using Intrinsic Motivation (up to four times fewer actions needed than baselines)
- Investigated methods for learning reusable skills hierarchically
- Implemented control systems for a 3 degree of freedom robotic head
- Performed routine diagnosis, maintenance and repair in the uBot robotic platform
- Technologies used: ROS (C++ and Python development), Deep Learning, Reinforcement Learning, SolidWorks

Platform for Ethical and Responsible Computing Education (PEaRCE) **Feb 2025 – Dec 2025**
Head Teaching Assistant (TA)

- Directed two six-person teams to embed C.S. ethical education in C.S. courses serving ~1100 students
- Supervised creation of software tools to automate administrative TA responsibilities to scale operations
- Coordinated between students, course instructors and PEaRCE research staff
- Directed ethics-focused discussion sessions for 5 courses
- Identified and implemented improvements to PEaRCE website to enhance user experience

TRACLabs, Inc. **Sept – Dec 2021, May – Aug 2022, June – Aug 2023**
Graduate Robotics Intern

- Developed software to improve teleoperator situational awareness using multiple autonomous agents
- Maintained and enhanced existing solutions for multi-agent path planning
- Designed and implemented RVIZ plugins and tools to improve user interaction
- Contributed towards experimental design and writing for research papers, reports, and documentation of projects

Indiana University **Feb 2016 – Present**
Research Affiliate

- Analyzed IMU movement data to develop computational, non-invasive and objective approaches for detecting Autism Spectrum Disorder, Attention-Deficit/Hyperactivity Disorder and their comorbidity
- Designed Deep Learning and Machine Learning algorithms based on systems neuroscience to achieve 71% accuracy
- Published and presented relevant work at numerous physics and neuroscience meetings

AITOE Video Analytics Pvt. Ltd. **July 2016 - July 2017**
Software Developer

- Designed and implemented online video analysis platform Newton for Search, Summarization and Statistics
- Developed and maintained aiSentinel Security Suite features like Camera Tampering Detection and Asset Tracking
- Researched technologies such as CMT to be implemented for Object Tracking
- Interacted directly with potential clients to identify their requirements and implement the same into our products
- Technologies used: C++, NodeJS, Python, PHP, Caffe, QT

SELECTED PUBLICATIONS

Deep Learning Diagnosis Plus Kinematic Severity Assessment of Neurodivergent Disorders | Scientific Reports, 2025
Learning Intrinsically Motivated Transition Models for Autonomous Systems | IEEE International Conference on Development and Learning, 2022
Evaluating Sensorimotor Abstraction on Curricular for Learning Manipulation Skills | IEEE International Conference on Development and Learning, 2022
Learning to Manipulate in Open Environments | Workshop on Learning of Manual Skills in Humans and Robots, 2020
Learning From Less Data: A Unified Data Subset Selection and Active Learning Framework for Computer Vision | Winter Conference on Applications of Computer Vision, 2019
Demystifying Multi-Faceted Video Summarization: Tradeoff Between Diversity, Representation, Coverage and Importance | Published at Winter Conference on Applications of Computer Vision, 2019

RELEVANT ACADEMIC PROJECTS

Spatial Model Building Using a Robotic Head

- Leveraged deep learning mechanisms and a 3 Degree of Freedom robotic head to build probabilistic models of the location of objects in free space
- These models were then used to select actions to achieve certain states

Chess Automated – an automated physical chess board

- Integrated chessboard.js to introduce an online version where one user can use our website
- Successful prototyping of online game play using Processing and MyRobotLab
- Developed an Android application which acts as the brain and controls the device using Java and C
- Debugged Arduino code that controlled the movement of the pieces using an X-Y plotter mechanism

TECHNICAL SKILLS

- Programming Languages: C, C++, Python, Java, Matlab, Arduino, Processing
- Robotics/ML: ROS, Reinforcement Learning, Deep Learning, Planning, SolidWorks
- Web Development: HTML, JavaScript, CSS, PHP
- Database Management: SQL, MongoDB