Yashraj Shanker

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Innovative engineer with expertise in robotics, AI/ML, and computer vision. Strong leadership in research and automation across autonomous systems, medical imaging, and manufacturing

EDUCATION

Carnegie Mellon University — Pittsburgh, PA
Master of Science in Mechanical Engineering – Research — May 2025
Relevant Coursework – Modern Control Theory ML in Healthcare, Computer Vision — **GPA: 4.00/4.00**

Drexel University — Philadelphia, PA
Bachelor of Science in Mechanical Engineering — June 2023
Minor in Finance — **GPA: 3.79/4.00**

SKILLS

Mechanical Design & Analysis: SolidWorks, Fusion 360, Ansys Workbench, Abaqus CAE, AutoCAD
Manufacturing & Simulation: GD&T, FEA, CNC Machining, 3D Printing, Injection Molding
Robotics & Automation: ROS2, PLC Programming, Mechatronics, Motion Control
Programming: Python, R, SQL, C++, MATLAB, Bash,
AI/ML: PyTorch, Scikit-Learn, Pandas, TensorFlow, Hugging Face, CNN, Deep Learning, Vision Transformers, NLPs

PROFESSIONAL EXPERIENCE

Centrillion Technology, Inc. — Palo Alto, CA
Intern (Machine Learning and Data Science) — June 2023 – August 2023

- Designed and implemented clean room automation procedures using mobile robotics and imitation learning
- Doubled workflow efficiency in DNA silicon chip production by integrating robotic automation solutions
- Led ML & data science interns, streamlining workflows and CEO communication, improving project deliverables
- Built a CNN to automate heatmap threshold prediction, reducing manual labeling in mice brain studies

Catalyx (Formerly Xyntek | CXV Global) — Newtown, PA
Junior Systems Engineer — September 2021 – March 2022

- Achieved 98% success on Factory Acceptance Test for a carton inspection module in cosmetics industry
- Programmed PreciseFlex 400 in Visual Basic, boosting pick-and-place efficiency by 20% for client demos
- Prototyped and developed an automated needle assembly with 10mm precision for pharmaceutical clients
- Designed 3D models for trade shows, optimizing logistics for faster booth setup at 2021-2022 expos

PROJECTS

Telesurgery – CERLAB at Carnegie Mellon University — Pittsburgh, PA
Masters Research Student (Professor Kenji Shimada) — September 2023 – Present

- Designed a real-time CV algorithm for guidewire and catheter tracking in surgeries
- Aligned computer vision techniques for guidewire segmentation, tracking, registration in anatomical models
- Developed a backpropagation algorithm for 2D-3D medical image registration
- Building a hybrid classical-deep learning model for unimodal medical image registration

Modern Control Theory – Autonomous Vehicle — Pittsburgh, PA
Project Lead — August 2023 – December 2023

- Developed PID, LQR, and full-state controllers, improving autonomous navigation and stability
- Implemented A path planning and EKF-SLAM for collision-free navigation and real-time localization
- Designed and validated state-space models to ensure controllability, stability, and accurate vehicle dynamics
- Optimized Python-based controllers, integrating sensor fusion and data visualization for performance analysis

Drexel – Senior Design Project – Team Electron — Philadelphia, PA
Design Lead — September 2022 – May 2023

- Designed CAD models for a multi-axis robot, demonstrating proof of concept for automated EV charging solutions
- Developed multiple robot arm iterations, assessing feasibility across various environments and scenarios
- Integrated and implemented a camera vision system, enabling robot arm simulation in static and dynamic environments

LEADERSHIP

- Graduate TA for 24-262: Mechanics 2: 3D Mechanics — January 2024 – Present
- Graduate TA for 24-677: Modern Control Theory — August 2024 – December 2024
- Graduate TA for 24-653: Materials and Their Processing for Mechanical Engineers — January 2024 – May 2024
- NASA Lunabotics: Founded Drexel's Lunabotics club — September 2022 – May 2023