Jake K. Mann

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Work Experience

Dynamic Motion Control, Inc. **San Diego, CA**
Automation Engineer *August 2024-Present*

- Rewriting pathing program for ABB IRB 6600 6-DOF robot to reduce client's mold pour time by 37%.
- Developing sales proposals for robotics and automation, securing purchase orders of more than $180k.
- Programming Siemens PLCs and HMIs across projects in Robotics, Defense, and Biotech sectors.

Duke Design Hub **Durham, NC**
Project Manager *August 2023-May 2024*

- Managed a team of undergraduate engineers to design and produce consumer product prototypes and research-grade lab devices, including automatic 'smart' syringes and testing rigs to quantify organic tissue strength.
- Taught advanced Fusion 360 CAD/CAM user courses and fabrication machine training.

Duke University Innovation Co-Lab **Durham, North Carolina**
Student Technician *February 2021-May 2023*

- Provided Duke students and faculty with guidance and resources with 3D printing, laser/waterjet cutting, and CNC machining.
- Advised on manufacturability and performance during design sprints, primarily using Fusion360 and Solidworks.

Education

M.Eng. Mechanical Engineering, Class of 2024 **Duke University**
Concentration in Autonomous, Intelligent Systems and Machines *GPA: 4.0/4.0*

BSE Mechanical Engineering, Class of 2023 **Duke University**
Focus in Robotics *GPA: 3.64/4.0*

Featured Projects- See ePortfolio

Compression of Neural Radiance Fields (NeRF) *Fall 2024*

- Applied quantization and iterative node pruning to enable efficient NeRF inference on consumer-grade GPUs.
- Reduced model size by over 75% while preserving up to 90% visual fidelity, evaluated using Peak Signal-to-Noise Ratio (PSNR) and Structural Similarity Index Measure (SSIM).

Rexy the T-Rex *Spring-Fall 2023*

- Designed and 3D-printed bipedal T-Rex robot with onboard Raspberry Pi, servos and battery.
- Programmed sinusoidal locomotion patterns in Python to achieve basic bipedal movement.
- Optimized gait with Deep Q Reinforcement Learning via the OpenAI gym environment and PyTorch.

Getaway Mobile Smart Home - Central Monitoring System *Fall 2022-Spring 2023*

- Developed system to monitor and control temperature, lighting, water levels, power usage, and emergency procedures.
- Prototyped using Raspberry Pi and HomeAssistantOS to integrate custom ESP-32 and off-the-shelf sensors into a unified interface.

Skills

Software: RobotStudio, SolidWorks, Fusion 360, ROS, Siemens TIA Portal, TwinCAT 3, WinCC Unified/Pro, Illustrator
Technical: CAD/CAM, Deep Learning for Robotics, Microcontrollers, FEA, CFD, State Machines
Manufacturing: 3D Printing, Laser Cutting, Waterjets, CNC (Tormach, ShopBot), Metal/Plastic Fabrication
Programming: Python, MATLAB, RAPID, Linux, C++, LaTeX
Languages: Spanish (Conversational / B2 Reading + Writing)