Maxime Zand

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EDUCATION

Master of Science in Robotics and Autonomous Systems **Expected December 2025**
Arizona State University (ASU) **Tempe, AZ**

- GPA : 4.0 / 4.0
- Relevant course work: Modeling and Control of Robots, Perception in Robotics, Computer Control Systems, Reinforcement Learning in Robotics, Advanced System Modeling & Dynamics & Control, Multi-Robot Systems

Bachelor of Science in Mechanical Engineering **December 2023**
Arizona State University (ASU) **Tempe, AZ**

- Relevant course work: Applied Machine Learning, System Dynamics and Controls (I&II), Circuits, Advanced Numerical Methods, Mechanical Engineering Design, Statistics, Finite Element Methods

EXPERIENCE

Graduate Research Aide **January 2024 - Present**
Battery Electric & Intelligent Vehicle Lab, ASU **Tempe, AZ**

- Designing a physical simulation platform to evaluate human interaction and intervention in autonomous driving algorithms aiding in 2 research projects.
- Utilizing Linux and Windows platforms to engineer a physical simulator operating 4 devices including a motion platform to replicate the accelerations and operational dynamics of autonomous vehicles within a virtual environment.
- Spearheading Python application development, integrating Carla physics simulator and Autoware autonomous driving stack with physical setup.

Research Aide **May 2023 - January 2024**
Advanced Manufacturing and Functional Devices Lab, ASU **Mesa, AZ**

- Collaborated with graduate researchers on development of projection micro-stereolithography 3-D printers.
- Expanded upon existing C++ control system software in both Python and C++ for quick development cycles.
- Leveraged PyQT and Python to re-conceptualize existing user interface and to render bitmap components of print into UV patterns on Digital Micromirror Device (DMD).

PROJECT EXPERIENCE

Surgical Robot Manipulation **August 2024 - Present**
Arizona State University **Tempe, AZ**

- Designing 3DOF robotic arm and 4DOF servo assembly in order to reanimate and control Intuitive Surgical Da Vinci Si surgical instruments using SolidWorks.
- Deploying firmware onto an Arduino Due to control 3 stepper motors, magnetic encoders, and 4 servos, enabling precise reanimation of medical instruments such as 5mm needle drivers using C++.

Robotics Control Simulation **January 2024 - May 2024**
Arizona State University **Tempe, AZ**

- Directed a team of 5 to create a MATLAB App for simulating manipulator dynamics and control responses, using App Designer for seamless user interaction.
- Implemented impedance and compliance control, deriving symbolic equations of motion, and GUI for manipulator analysis and data visualization.

Distilling Symbols from Perceptual World Models **January 2024 - May 2024**
Arizona State University **Tempe, AZ**

- Researched distilling symbols out of the latent vectors learned by the Dreamer family of reinforcement learning models, specifically DreamerV3.
- Applied machine learning techniques, including a sparse autoencoder, to analyze and identify mutual information between DreamerV3 and the ground truth state in the Crafter domain.

SKILLS

Programming/Frameworks: Python, MATLAB, C/C++, C#, OpenCV, TensorFlow/Keras, PyTorch, PyQT
Tools/Environments: Raspberry Pi/Arduino/Embedded Systems, Robot Operating System (ROS), Git, Linux/Ubuntu
Design and Modeling: MATLAB/Simulink, Computer Vision, SLAM, SolidWorks, ANSYS (+ Fluent), Microsoft Office