Rami Hamada

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Education

The University of Texas at Austin Expected May 2027
B.S. in Electrical & Computer Engineering Austin, TX

- **GPA:** 3.92/4.00

Research & Technical Experience

Advanced Robotic Technologies for Surgery Laboratory Aug 2024 – Present
Undergraduate Research Assistant Austin, TX

- **Liquid Metal 3D Printer**
  - Built the entire software stack for a modified 3D printer enabling gallium-based sensor fabrication
  - Implemented ROS2 architecture separating motion, extrusion, and UI, reducing motion latency by 35%
  - Modified firmware to support custom syringe toolhead and heater designed by mechanical team
  - Developed coordinate transforms using 4-point registration to align print paths within custom molds, reducing setup time by 70%
  - Created Python GUI for motion control, parameter tuning, and path visualization, enabling 10+ test configurations per session
  - Automated force-displacement tests, reducing sensor characterization time by 90%
- **Colonoscopy Robot**
  - Implemented 4-DOF robotic control with Xbox controller input mapping
  - Integrated NDI Aurora magnetic sensor for <1mm tracking of the endoscope position and orientation
  - Established remote teleoperation over Tailscale with <100ms latency
  - Streamed camera feed to UI for visualization of pre-trained tumor detection model
- **Inflatable Robot Motor Driver PCB**
  - Designed and fabricated a USB-powered motor driver for a vibration-driven inflatable robot
  - Selected DRV8837 H-bridge, 3.0V LDO, and polyfuse for compact low-voltage motor control
  - Created schematic and layout in Altium with JST connector and Arduino Nano RP2040 header

Projects

Buck Converter PCB

- Designed and fabricated a buck converter with dual MOSFET switching stage and LC output filter
- Implemented op amp feedback loop for output regulation and current sensing
- Created schematic and layout in KiCad, validated output across 5V to 20V input range

Skills

- **Languages:** Python, C/C++, Java, Bash
- **Robotics & Embedded:** ROS2, Dynamixel SDK, firmware modification (Prusa), UART, RS-232, Arduino
- **Electronics:** Oscilloscope, multimeter, soldering, PCB design (Altium, KiCad), LTspice
- **Tools:** Linux, Git, Docker, wxPython, Tkinter