Happy to discuss research and projects in these general areas: Programming in the Small; Highly Reliable Systems; Mobile Everything.

Dr. Honig works with colleagues and students on small systems where the developer controls everything (real time, size, performance, reliability); robots and systems that require control of vision, touch, sound, light; and building custom hardware as well as software with sensors and control units that interact with or measure the environment. Dr. Honig is currently exploring software and systems solutions for Wearable Area Networks which he believes are the future of mobile computing and communications.

All of these require high quality software engineering using careful process and measurement of quality metrics.

See below for two specific research projects seeking interested students. Feel free to suggest others based on the above. I’ll consider anything that has some match between your interests and mine!
Applying Software Audits from Telecommunications Systems to Contemporary Computer Systems.

Analytical Study of Past Papers on Topic.

Real Time, High Quality Switching System Papers

Today many mobile and cloud based applications do not achieve similar reliability. Software audit techniques have not received much attention recently and offer some potential to augment current approaches for dependable systems.

Software audit approaches typically are implemented alongside or separately from the main function software to watch for, detect and possibly correct reliability flaws before they have major impact on the system. Software audits including targeted checks of memory resources and selective termination of non-essential tasks appear promising for further investigation. Their application to contemporary mobile and distributed application architectures should be further explored.

Research Abstract: modern computer based systems may benefit from greater use of the software audit approach used in telephony switching systems as long ago as the 1970s. Such approaches allowed telephone systems to successfully run large networks at reliability levels comparable to the then state-of-the-art electromechanical systems.
Real-time Limitations and Characterization of Arduino Sensor Systems
Hands on Tinkering and Evaluation

Arduino Landing Beacon,
Real Time Stress Test

This project used Arduino industrial strength micro computers to build and test small hardware systems, then test the performance impact of various software structures and approaches.

You need to have some interest in computer architecture and sensors and know just a bit about electricity (Ohm’s Law, watts, volts, current, etc.)

Sensors to be used depend somewhat on your interest, but can include motion, light, current, sound, and acceleration.

Software will be C and hands on work.

Research Abstract: most student projects never have to even consider real time limitations or how their code impacts performance. In small, real time, embedded systems, that is not always true.