# Andrew Zoghby

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## 🎓 Education

**May 2022**  **University of Illinois Urbana-Champaign** *BS in Computer Engineering, Minor in Statistics.*
GPA: **3.88** / 4.0 | College of Engineering Dean's List Every Semester

## 💼 Work Experience

**Embedded System Engineer,** *Micron Technology*                                       May 2021 - Aug 2021
- Devised state of the art communication system utilizing USB to lower execution times, on both the USB host and slave devices, by 99.9%.
- Overhauled legacy testing systems to identify new defects which were causing increased defects on the end product and manufacturing downtime.
- Repaired and upgraded an FPGA programming system to increase robustness.
- Developed embedded software interface to cutting edge power electronics.
- Collaborated with multiple teams to integrate separate deliverables into a cohesive customer experience.

**Autonomous Vehicle Researcher,** *FRESH Lab*                                       Feb 2021 - May 2021
- Coordinated team to build a realistic ROS Gazebo simulation of a farm tractor.
- Formulated forward kinematic algorithms for Ackermann steering models to perform odometry.
- Analyzed and tested non-holonomic motion planning algorithms.
- Prototyped mechanical retrofits to allow autonomous control of a tractor.

**Digital Signal Processing Research,** *College of Veterinary Medicine*                   Aug 2020 - Aug 2021
- Collaborated with doctors to identify and explain appropriate signal processing techniques to extract key medical information from ECG signals, which cannot be seen directly in the raw data.
- Implemented digital signal processing algorithms in C++ to improve performance.
- Designed an encoding scheme to pass multi-channel ECG data over a wireless network.
- Engineered an efficient signal processing algorithm for low compute power devices.

**Control Systems Engineering Intern,** *Caterpillar*                                   May 2019 - May 2020
- Calculated the risk of faults and the effectiveness of the short term fixes.
- Used statistics to recommend solutions that minimize customer impact.
- Integrated new requirements into existing control system specifications.
- Implemented advanced control system algorithms with Matlab Simulink.

## 💻 Projects

**Monocular Visual Odometry Control System**
- Read and understood state of the art Visual Odometry algorithms from published papers.
- Implemented start of the art localization algorithms in Python using OpenCV.
- Used a distributed robotics system, ROS, to run real time algorithms on UAVs
- Adapted published odometry algorithms to determine absolute position of the micro-drone 3D space.

**Operating System**
- Designed OS and Kernel from scratch in C, using Intel x86 documentation.
- Provided multitasking capabilities on a single core system.
- Implemented advanced memory management techniques such as paging.
- Created interrupt based drivers for 3rd party devices using data sheets.

## Skills

C, C++, x86 ASM, Java, Python, Matlab Simulink, Visual Basic, HTML, LaTeX
git, Android Development, Linux System Development, Microsoft Office, Circuit Analysis, Control Theory

## Relevant Courses

ECE 470 Robotics, ECE 486 Control Systems, ECE 391 Computer Systems Engineering, CS 374 Algorithms and Models of Computation, STAT 428 Computational Statistics, ECE 313 Probability in Engineering, CS 225 Data Structures, ECE 210 Analog Signals and Systems

## Awards

UIUC College of Engineering Dean's List, HackIllinois Unanimous Grand Prize Winner, Uncommon Hacks First Place IOT Prize Winner, Eagle Scout, FIRST Robotics Dean's List Semi-Finalist