

# Thomas Scherlis

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## EDUCATION

### CARNEGIE MELLON UNIVERSITY

- Electrical and Computer Engineering
  - Focus in Robotics
- Expected Dec. 2021 | Pittsburgh, PA  
GPA: 3.88

## LINKS

Portfolio: <http://tomscherlis.com>  
LinkedIn:// Tom Scherlis  
Github:// Toms42

## TEACHING ASSISTANT

- Structure and Design of Digital Systems: Fall 2018
- Principles of Imperative Computation: Summer 2018

## COURSEWORK

### Completed:

- Adaptive Control and Reinforcement Learning (PhD level)
- Planning Techniques for Robotics
- Advanced Mobile Robot Development
- Computer Vision
- Robot Kinematics and Dynamics
- Control Systems
- Embedded System Design
- Artificial Intelligence
- Computer Graphics
- Signals and Systems

## SKILLS

### CONCEPTS

Control systems (PID, LQR, MPC)  
• Trajectory planning • Embedded systems • Networks • Simulation  
• Mechatronics

### PROGRAMMING

Experienced: Python • Matlab  
• C • C++ (modern)

### COMPUTING HARDWARE

PCB design and layout • TI and Atmel 32 bit Microcontrollers • Intel FPGA

### TOOLS AND FRAMEWORKS

ROS • Qt • FreeRTOS • Altium  
• Solidworks • Linux/Unix • Git • SVN  
• Agile • Docker

## EXPERIENCE

### ZIPLINE INTERNATIONAL | Software Intern

Fall 2020 - Ongoing

- Leading software development on prototype system.
- Implementing software using ROS for networking, controls, mission management, and health monitoring.

### APPLE INC | Hardware Test - Software Intern (Remote)

Summer 2020

- Lead development of internal tool to aid in test station bring-up and documentation.
- (Original project involving computer vision and robotics cancelled due to constraints from Covid-19.)

### ZIPLINE INTERNATIONAL | Embedded Software Intern

Summer 2019

- Developed embedded software for the world's largest autonomous drone delivery network.
- Designed a system to allow smart CAN-connected battery docking ports to safely share chargers, increasing charging and logging throughput.
- Supported the release of Zipline's next generation vehicle, which utilizes a distributed system of microcontrollers each running a real time OS.

## ACTIVITIES:

### CMU ROBOSUB: TARTAN AUV | Co-Founder and President

- Lead development of two Autonomous Underwater Vehicles (AUVs) to compete annually in the international RoboSub competition.
- Lead and Maintain software stack developed with ROS and Gazebo for python and C++, including guidance, navigation, controls, and perception.
- Lead design of electronics and sensor system, including an NVIDIA Xavier, Doppler Velocity Log, inertial measurement unit, cameras, and sonar.
- Raised and manage \$40k team budget for 2020; placed fifth overall.

### ROBOMECHANICS LAB | 2020

### ROBOTICS CLUB | 2020 General Officer

### CARNEGIE MELLON RACING (CMR) | 2017-2019

## PROJECTS

### MODEL BASED CONTROL FOR AGILE DRONE FLIGHT |

[tomscherlis.com/dronempc](http://tomscherlis.com/dronempc)

- Implemented optimal minimum snap trajectory generation for drone racing gates.
- Designed real-time Model Predictive Controller (MPC) with differentially flat quadcopter model.

### FULL-BODY VR FLIGHT SIMULATOR | [tomscherlis.com/quidditch](http://tomscherlis.com/quidditch)

- Created simulator with procedural terrain generation using Unity 3D.
- Winner of Faculty Choice and Builder's Choice awards at the 2018 CMU Build18 Hackathon.

### REAL-TIME FLUID SIMULATOR | [tomscherlis.com/lbm](http://tomscherlis.com/lbm)

- GPU-accelerated Lattice-Boltzmann fluid simulator written in CUDA-C.

**INTERESTS:** Robotics • Embedded Systems • Planning and Controls