

# Christopher Tomaszewski

## Robotacist

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## Professional Experience

### Senior Research Scientist | Georgia Tech Research Institute

Atlanta, GA - Winter 2020 to Present

- Developed and fielded autonomy software and algorithms for UAVs, USVs, and UUVs.
- Contributing member on the board for the Unmanned Maritime Autonomy Architecture (UMAA), a forthcoming government autonomy standard.
- Proposed and served as Principle Investigator for multiple Internal Research and Development (IRAD) projects.
- Led software development and testing efforts for the joint OUSD/DARPA DRAGON project pursuing alternative forms of PNT.
- Served as the Software & Autonomy Subject Matter Expert (SME) for the government team on the DARPA Manta Ray program.

### Co-Founder/Director of Innovation | Platypus LLC.

Pittsburgh, PA - Summer 2012 to Present

- Contributed across all aspects of the company helping it grow from a research group handcrafting individual robots in a university basement into a small business with multiple models of cost-effective autonomous surface vehicles and successful deployments across five continents.
- Led the manufacturing, engineering, and R&D efforts within the company.
- Managed and trained groups of assembly workers, interns, and engineers.

### Consulting Robotics Engineer | Perceptronics Solutions Inc.

Pittsburgh, PA - Spring 2018 to Winter 2019

- Led the development and implementation of a multi-agent UAV platform to demonstrate the capabilities of custom mission management software developed as part of Army REP 2018.
- Organized and conducted field testing efforts for the platform throughout development.
- Supported system deployment at the Marine Corps' manned-unmanned teaming limited operational assessment.

### Robotics Engineer | Caterpillar Inc.

Pittsburgh, PA - Winter 2011 to Spring 2014

- Designed and developed the sensor fusion and tracking systems for the Caterpillar Detect object detection product.
- Built an image dataset management and annotation tool to streamline the creation of training datasets for object detection.
- Implemented a personnel tracking system based on active RFID ranging technology for use on autonomous tracked vehicles.

### Mobile Software Engineering Intern | Noblis

Falls Church, VA - Summer 2009

- Developed an augmented reality visualization application for Android smartphones to display geolocalized radiation data.
- Implemented KMZ parsing to display a 3D COLLADA object at a particular GPS location in augmented reality.

## Select Projects

### Constraint-Based Coverage Path Planning (Ph.D. Thesis)

- Developed a novel architecture for coverage path planning based on the concept of path constraints, an extensible building block for path plans.
- Designed several optimizations within this architecture in order to improve energy-efficiency of coverage plans for regions with moving fluids.
- Built a ASV test platform and conducted field experiments to demonstrate real world efficacy of the energy-efficient coverage planner even in the absence of complete knowledge of surface currents.

### Multi-Agent Decentralized Planning for Adversarial Robotic Teams

- Designed, built, and programmed 20 autonomous surface vehicles as a test platform for the GAMS and MADARA middlewares for distributed AI.
- Implemented several distributed algorithms for surface-to-air signaling using vehicle formations and asset defense against a line-of-sight attacker.
- Deployed the platform at the NATO CMRE REP17 Exercises in the Atlantic Ocean off the coast of Troia, Portugal.

References Available upon Request

## Education

### Carnegie Mellon University

Ph.D. in Robotics  
Graduation Date: December 2020

### Carnegie Mellon University

M.S. in Robotics  
Graduation Date: December 2013

### Carnegie Mellon University

B.S. in Computer Science  
B.S. in Mechanical Engineering  
Graduation Date: May 2012

## Skills

### [Robotics]

Path Planning Algorithm Design, ROS, Zenoh, OpenCV, Isaac Sim, SIL/HIL Testing, Field Testing

### [Programming Languages]

Python, C++, C, Rust, Java

### [Software Development]

NumPy, SciPy, Boost, Docker, Git

### [Engineering Software]

Solidworks, OnShape, Matlab/Simulink

### [Foreign Languages]

Native Speaker of Polish  
Intermediate Spanish

## Service

### Judge of Elections

Allegheny County, PA  
Municipality of Etna, Ward 1  
November 2017 - November 2019

### RoboTsar (President)

RoboOrg - CMU Robotics Institute  
Graduate Student Organization  
Spring 2015 - Spring 2016

## Select Publications

### Low-Cost Unmanned Underwater Vehicles for Multi-vehicle Autonomy Testing

Natalya Gage, Chris Tomaszewski, Shaun Anderson, and Sean Wilson  
OCEANS 2022 Hampton Roads

### Augmenting LSPIV Surface Current Measurement with Drifting ASVs

Chris Tomaszewski, Paul Scerri, and John Dolan  
OCEANS 2018 MTS/IEEE Kobe

### Planning Efficient Paths through Dynamic Flow Fields in Real World Domains

Chris Tomaszewski and Paul Scerri  
OCEANS 2013 MTS/IEEE San Diego

[christomaszewski.github.io](https://github.com/christomaszewski)