

Anthony T. Wertz



✉ awertz@cmu.edu

✉ awertz@pm.me





in anthonytw

🌐 anthonywertz.com

Education

- 2020-*2026  **Ph.D. Student in Robotics**, Carnegie Mellon University
Tunable-friction contacts for soft robotic locomotion and sensing.
- 2005-2012  **B.Sc., M.Sc. in Computer Engineering**, University of Central Florida.
Intelligent systems and machine learning focus. Designed three-phase AC to DC rectifier for a wind turbine-powered battery charger. First place, 2009 Future Energy Challenge.

Employment History

-  **Research and Development Engineer (intern)**, Arieca.
Spring 2024
- Designed and built a custom test apparatus for investigating the effects of high-voltage electric fields near materials susceptible to degradation due to ion migration. The device generates a DC potential up to 6 kV in close proximity to a material sample to allow investigation of its degradation over time and to inform the use of such materials near high-voltage electronics, as in the case of thermal interface materials for power modules on electric vehicles.
 - Devised and demonstrated a novel sensor design to detect localized strain in elastic objects requiring just a four-wire device interface and a simple sensor element design.
-  **Senior Analyst**, Auton Systems.
2015 - 2020
- Architected an analytic software platform for monitoring health and scheduling maintenance of complicated equipment.
-  **Senior Research Analyst and Programmer**, Auton Lab, Carnegie Mellon University.
2014 - 2020
- Integrated various biomedical monitoring devices and actuators, and designed and developed a software monitoring and control application to run real-time closed-loop resuscitation for assessing and treating hemodynamic instability.
 - Developed software and analyzed data as part of applied research aimed at solving many challenging problems of societal importance including: detection of human trafficking to aid police force and investigators; localization and classification of threatening radiation sources; and analysis of patient vital signals to identify instability.
 - Converted high level research algorithms into scalable real time applications, including a computer vision pipeline for extracting blood vessels, velocities, and flow patterns in videos of microvascular bloodflow.
 - Applied machine learning methods to complex problems, including the featurization of vital sign data and detection of bleeding in pig models of hemorrhage. Methods included training various classification and regression models (logistic regression, neural networks, random forests, etc), validating using a cross validation framework, and evaluating performance through ROC and AMOC curves. Clustering approaches used as well, e.g. K-means for grouping similar subjects.
 - Optimized code for memory and time complexity and implemented algorithms using a variety of parallel processing frameworks (e.g. multithreading in C++ with OpenMP, pthreads; in R with doParallel and foreach packages; multiprocessing in Python and MATLAB; using hadoop on compute clusters; and moving video processing to the GPU using the C/C++ CUDA, CUDNN, and CUFFT APIs).
 - Predominantly developed with C/C++, Python, R, and MATLAB languages, including building wrappers to incorporate high-performance C/C++ software in the interpreted languages (e.g. using boost::python, Rcpp, and MATLAB mex).
-  **ASIC Design Engineer (intern)**, AMD Advanced Micro Devices.
Summer 2012
- Developed a system test automation suite to streamline the unit testing of individual GPU modules and characterize their performance in terms of power and computational efficiency in a repeatable manner.
 - Debugged microcode on unique microprocessors incorporated in GPU ASIC, including APU power management control inefficiencies.

Employment History (continued)

📌 **Embedded Software Engineer**, Lockheed Martin Missiles and Fire Control.

2009 - 2011

- Developed, tested, and integrated operational flight program software incorporating safety critical software components in a GPS and INS guided projectile. Updated and maintained software for performing vehicle guidance, navigation, and control, device communication, and telemetry.
- Supported off-site projectile launch and flight tests, system integration efforts, and software development efforts along with customers and contractors.
- Developed and utilized various levels of test frameworks for the system including module level unit testing, software simulation, and hardware-in-the-loop simulation incorporating simulations of satellite constellations, vehicle dynamics, physics, and environmental forces. Developed and debugged software on hard real-time operating systems running on various processor technologies (PowerPC, MIPS, Intel).
- Worked directly with subcontractors and customers to solve issues and support off-site hardware and software test installations, as well as facilitating independent verification and validation.

📌 **Software Engineer (intern)**, Lockheed Martin Missiles and Fire Control.

2008 - 2009

- Made substantial improvements to integration test tools interfaces and functionalities for evaluating operation, behavior, and performance of a tri-mode seeker (radar, infrared, and laser-guided).
- Developed and debug software tools on Windows and Linux using Qt and MFC user interface frameworks, along with embedded operational flight program software on Integrity real time operating system.

📌 **Software Engineer (intern)**, DiSTI (Distributed Simulation Technology Inc.)

2006 - 2007

- Rebuilt backend of in-house web tools using PHP and MySQL.
- Reimplemented C++ simulations in Java using the company's simulation framework.

📌 **Web Developer**, Freelance

2002 - 2008

- Developed web software for a variety of clients involving database application development in ASP and VB-Script using MSSQL, or PHP with MySQL.

Skills

Human Languages	📌	English (native), Spanish (Intermediate), French (Intermediate).
Robot Languages	📌	C/C++, Julia, Python, MATLAB, R, Java, Go, PHP, Object Pascal
Tools	📌	Visual Studio Code, MATLAB, Jupyter, SEGGER Ozone, KiCAD, OnShape