

Jet Townsend, IDSA

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Introduction

I am a designer and engineer with an interest in creating hardware and software that improves the human condition. I have more than 20 years experience in projects including software development, analog electronics, physical computing, digital fabrication, and art projects including vehicles and small architecture. Since 2009 I have directed a small consultancy in Pittsburgh, functional prototype, which creates proof-of-concept models, working prototypes, and customized physical interaction devices. My personal and professional projects include industrial and interaction design, contributing to open-source software and hardware projects, motorcycle restoration, and music performance.

Founder, functional prototype

(2009 - current)

Design and implement open source software and user interfaces for digital fabrication, environmental monitoring, and home-scale manufacturing platforms. Enter design contests and design physical items for my online stores.

Design and create proof of concept models, working prototypes, and customized physical interaction devices using digital fabrication hardware.

Portfolio: functionalprototype.com

Employment Experience

Adjunct Professor, Carnegie Mellon University School of Architecture, IDeATe

(Spring, 2022)

Instructor of Record for [48-339 Making Things Interactive](#) in the CMU School of Architecture taught as an IDeATe class. Students apply what they have learned in 60-223 (Introduction to Physical Computing) to create innovative interaction experiences. With 100% of students responding, my course evaluations were 5/5 for "Overall Teaching" and 5/5 for "Overall Course".

Adjunct Professor, Carnegie Mellon University School of Architecture, IDeATe

(Fall, 2020)

Instructor of Record for [48-339 Making Things Interactive](#) in the CMU School of Architecture taught as an IDeATe class. Students apply what they have learned in 60-223 (Introduction to Physical Computing) to create innovative interaction experiences with enhanced accessibility. This semester was taught entirely remote using a combination of Zoom and Skype. This includes all lectures, critiques, assignments, and office hours.

Adjunct Professor, Carnegie Mellon University School of Architecture, IDeATe

(Fall, 2019)

Instructor of Record for [48-339 Making Things Interactive](#) in the CMU School of Architecture taught as an IDeATe class. Students apply what they have learned in 60-223 (Introduction to Physical Computing) to create innovative interaction experiences.

Senior Engineer, Carnegie Mellon University Human Computer Interaction Institute

(March 2018 - March 2019)

Co-author, "EduSense: Practical Classroom Sensing at Scale". Proc. ACM Interact. Mob. Wearable Ubiquitous Technol., Vol. 3, No. 3, Article 71 (September 2019). <https://doi.org/10.1145/3351229>

Design and develop software for a HCII project under Assistant Professor Amy Ogan.

- Design and implement a Qt5 GUI for controlling OpenPose pose location software
- Customize OpenPose to meet research goals
- Set up a task scheduling system using JobScheduler to record classes for research
- Write tests to determine optimal configuration by room size and number of students

Adjunct Professor, Carnegie Mellon University School of Architecture, IDeATe

(Spring, 2018)

Instructor of Record for [48-339 Making Things Interactive](#) in the CMU School of Architecture taught as an IDeATe class. Students apply what they have learned in 60-223 (Introduction to Physical Computing) to create innovative interaction experiences.

Adjunct Professor, Carnegie Mellon University School of Art, IDeATe

(Fall, 2017)

Instructor of Record for [60-223 Introduction to Physical Computing](#) in the CMU School of Art taught as an IDeATe class. Students learned the basics of physical computing using the Arduino, sensors, motors, speakers, and visual output devices.

Adjunct Professor, Carnegie Mellon University School of Art

(Fall, 2016)

Instructor of Record for 60-210 EMS2: Introduction to Interactivity and Computation in the CMU School of Art. This is a required class for School of Art sophomores. Students learned the basics of JavaScript (using the p5.js environment) and how to create elementary interactive art.

Independent Consulting and Research

(October 2014 - December 2022)

- Work for clients under NDA
- Enter DJI/Shapeways "[Drone accessory](#)" contest, win [Honorable Mention](#)
- Design and develop new laser cutter control application
- Design and fabricate products for [Etsy](#) and [Shapeways](#) stores

UI Engineer, Apple

(January 2012 - October 2014)

Implemented UI software requirements in Objective C for OSX and iOS applications in the Apple Productivity Tools and iWork products. Reported and fixed bugs in iWork products.

Independent Research Project

(January 2011 - January 2012)

Worked on a research project involving interaction design, music, and mechanical/kinematic live performance.

Senior Security and Privacy Engineer, TiVo Inc.

(June 2001 - January 2011)

Developed policies, protocols, and software tools to protect customer security and privacy on all components of the TiVo product line and service. Designed and implemented user interfaces and navigation systems implementing TiVo's privacy and security policies. Wrote and taught in-house classes on hacking, security, and customer privacy. Designed and developed machine learning tools that analyze TiVo's large, anonymous, and proprietary data collections.

Independent Consultant

(June 1998 - June 2001)

Worked with startups delivering handheld solutions and secure online commerce. Provided technical editing services for *Teach Yourself Perl in 21 Days* by Laura Lemay.

Senior Software Engineer, Liquid Audio, Inc.

(April 1997 - June 1998)

Designed and developed online commerce systems and musical recording rights reporting systems

Multiple Roles, General Magic, Inc.

(July 1994 - April 1997)

Performed tasks as IT tech lead, software engineer, and the Manager of Online Communications.

Parallel Systems Engineer, NASA Ames Numerical Aerodynamic Simulations Division

(July 1992 - July 1994)

Developed graphic data visualization software and simulation tools for the massively parallel super computers iPSC/860, CM-5, and Paragon.

Personal Teaching Experience

Arduino Workshops, Carnegie Mellon University School of Design

(Multiple semesters, 2013 - 2017)

Guest speaker at 51-434 (Experimental Form) introducing the Arduino environment to School of Design students creating experimental interfaces for radios.

Cybersecurity Workshops

(2016 - 2020)

Cryptoparty Workshop at the Frank-Ratchye STUDIO for Creative Inquiry, December 2016.

Organized and co-taught a clinic on personal cybersecurity.

Personal Safety Workshop at a local bookstore; presented on protecting personal privacy and safety while taking actions as a political activist or artist.

Safety Workshops

While working as an artist, engineer, and educator, give presentations and classes on safety using hand tools, analog electronics, wood shop, metal shop, welding, 3D printers, laser cutters, and other fabrication tools.

Patents and Publications

- Co-author, [U.S. Patent 7933950](#), "Secure control of features of a digital device"
- Co-author, "EduSense: Practical Classroom Sensing at Scale". Proc. ACM Interact. Mob. Wearable Ubiquitous Technol., Vol. 3, No. 3, Article 71 (September 2019). <https://doi.org/10.1145/3351229>

Education

Master of Tangible Interaction Design, Carnegie Mellon University

(May 2009)

My research was in the areas of computational situational awareness, physical computing for tactical surveillance and fine arts, and passive haptic feedback. While a student I taught physical computing and interaction design using Arduino and Processing.

My coursework included classes in data visualization, interaction design, live performance and interactive technology, machine learning and art, history of clothing design, and Japanese.

Bachelor of Arts in Journalism, Computer Science, University of Houston,

(1991)

Studied journalism, communications theory, photography, and propaganda; a strong minor in Computer Science.

Training and Certifications

- CITI Social and Behavioral Responsible Conduct of Research
- CITI Social and Behavioral Research - Basic
- Red Cross CPR - redcross.org/confirm 00J2O9I
- Stop the Bleed(r) Course, November 2021
- Certified Pistol Instructor
- Certified Range Officer
- Advanced Master Gunsmith, American Gunsmithing Institute (AGI)
- Master Armorer, American Gunsmithing Institute (AGI)
- AGI Certified Firearms Appraiser, Certification #845297
- General Class Amateur Radio license, KC3H5O

Skills and Preferred Tools

- Programming Environments: C, C++, Perl, Python, Qt5
- Creative Coding Toolkits: openFrameworks, p5.js
- Microcontroller Prototyping: Arduino, Raspberry Pi, BeagleBone
- CAD, 2D/3D Design Software: Rhinoceros, SolidWorks, Adobe Creative Suite
- Digital Fabrication: Experienced with many types of 3D printers, laser cutters, and CNC machining
- Manual Fabrication: GTAW and gas welding, metal and wood lathes, mills, and shop tools
- Still photography
- Video and audio production
- Cybersecurity and electronic privacy for individuals

Additional Technical Qualifications and Projects

- Contributor to open source hardware and software initiatives including Arduino, Lasersaur, Marlin
- Co-founder/co-director of Dorkbot Pittsburgh, a monthly lecture series on art and technology
- Safety Officer and Board Member for the Pyrotopia Fire Festival (2012)
- Professional Memberships: ACM, ARRL, EFF, IDSA, IXDA