

J. Eric Townsend, IDSA

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Objectives

I am a designer, maker, and arts-engineer, with a professional interest in using, designing and evangelizing new tools for creativity. I have more than 20 years' experience developing projects with DIY technologies and other arts-engineering workflows, including software development, electronics design, computer-aided design, and digital fabrication. For the past eight years, 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 range from industrial design products and open-source software to art-cars and music performance. I run a clean, well-organized studio; I have a very healthy respect for safety; and I love to empower people by teaching them how to create their own circuits, software, clothing, and costuming accessories.

Founder, functional prototype

(2009 - current)

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

- Lasersaur, open source laser cutter: 4th prototype, current release candidate
- 3D (FDM) printers: MakerBot Cupcake, MendelMax 1.5, E3D BigBox
- Embedded computers: Arduino, BeagleBone, and Raspberry Pi
- Waterjets, plasma cutters, GTAW, GMAW, and oxy acetylene welders
- Design and build 4D CNC metal mill (current project)

Design and implement open source software for digital fabrication, environmental monitoring, and home-scale manufacturing platforms.

Portfolio: functionalprototype.com/portfolio

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, and Advanced Japanese.

Bachelor of Arts in Journalism, University of Houston,
(1991)

Studied journalism, communications theory, photography, and propaganda as a major with a minor in Computer Science.

Teaching Experience

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. Taught a section of a required class for Art sophomores. Students learned the basics of JavaScript (in the p5.js environment) and how to create elementary interactive art. With 75% of students responding, my course evaluations were 5.00/5 (for "Overall Teaching") and 4.67/5 (for "Overall Course").

Arduino Workshops, Carnegie Mellon University School of Design
(Multiple semesters, 2013 - 2017)

Guest speaker at 51-434 (Experimental Form) introducing the Arduino environment to design students creating new interactive interfaces for radios.

Cybersecurity Workshops
(2016 - 2017)

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.

Employment Experience

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.

Senior Security and Privacy Engineer, TiVo Inc.

(June 2001 - January 2011)

Designed and implemented user interfaces and navigation systems implementing TiVo's privacy and security policies. Developed policies, protocols, and software tools to protect customer security and privacy on all components of the TiVo product line and service. 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.

Designed and implemented infrastructure for provisioning TiVo DVR service in a secure manner, partially illustrated in U.S. Patent 7933950.

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 massively parallel super computers.

Skills and Preferred Tools

- Programming Languages: C, C++, Python, JavaScript
- Creative Coding Toolkits: Processing, 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 and mills, various shop tools

Additional Technical Qualifications and Projects

- Additional skills: light construction, photography, cybersecurity, electronic privacy
- Amateur Radio: General Class Amateur Radio license, KC3HSO
- Open Source: contributor to open source hardware and software initiatives including Arduino, Lasersaur, openFrameworks, Reprap
- Organizer: Co-founder/co-director of Dorkbot Pittsburgh, a monthly lecture series about art and technology
- Safety: Safety Officer and Board Member for the Pyrotopia Fire Festival (2012)
- Professional Memberships: ACM, ARRL, IEEE, IDSA, IXDA

In addition to the above, I have managed a home fabrication facility for the past 10 years, including an electronics studio, 130W laser cutter, metal lathe and metal milling machine. I am well-versed in shop safety procedures and considerations.

Patents

- Co-author, U.S. Patent 7933950, "Secure control of features of a digital device"

