

Tim McNerney

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Objective

A cross-disciplinary position emphasizing user-centered design, engineering, and technical leadership.

Education

Massachusetts Institute of Technology, *S.M. Media Arts and Sciences*, 2000

Thesis: *Tangible Programming Bricks: An Approach To Making Programming Accessible to Everyone*

Advisors: Fred Martin, Mitchel Resnick, MIT Media Lab Learning and Epistemology Group

Project: Designed custom LEGO bricks containing embedded microprocessors that communicates with adjacent bricks to embody and interpret a physical computer program that a child constructs with their hands.

Union College, Schenectady, New York, *B.S., Computer Science and Music*, 1983

Awards

Cooper-Hewitt Tech Museum Awards Laureate, 2005

Victor Herbert Prize in Music, Union College, 1983

Skills and Specialties

Software: Embedded systems (ARM, PIC, AVR, TI), behavior-based robotics, software development tools (compilers, interpreters, translators, debuggers, profilers, simulators), DSP algorithms, communications (USB, FireWire), HDL-based CAD, formal verification software. **HCI:** Tangible user interfaces, user experience (UX) design. **Languages:** Expert: Embedded C, Common Lisp; Proficient: Assembly language, C++; Past favorites: Java. **OS/tools:** Linux, svn, git. **EE:** PCB design, VLSI/ASIC design; motor control logic, switching power supplies. **CAD tools:** Protel/Altium (PCB design), UCB Magic, Mentor Graphics (full-custom VLSI design), Synopsys Virsim (Verilog simulation). **MechE:** Plastic injection molding, prototype fab, custom end-effectors

Professional Experience

Closure Associates, *Lead Software Engineer*, 1/2014-Present (<http://www.closure.com>)

Software architect, technical lead, liaison with client hardware, product design group, reporting to senior V.P.

Rethink Robotics, *Senior Software Engineer*, 11/2010-12/2013 (<http://www.rethinkrobotics.com>)

Component expert. Responsible for design and implementation of high-level, behavior control software for a humanoid industrial robot. Analyze real-world tasks and applications in order to inform product design. Work closely with UI, UX teams. Wrote object-oriented sub-language with C++ semantics.

ITA Software, *Technical Consultant, Software Engineer* 4/2008-11/2010 (<http://www.itasoftware.com>)

Triaged and solved the most complex customer problems, traffic analysis and server farm resizing reports; interacted daily with customer-facing support staff. Developed portions of a modern airline reservation system, working closely with product management, core engineering, DB, and GUI design teams.

Tuva Design, *Principal, Curator*, 2006-2008 (<http://www.4004.com>)

Concept, fund-raising, reverse engineering, interactive design, and leadership of engineers and designers to create an interactive exhibit for the Intel Museum celebrating the world's first microprocessor. On exhibit: 2006-present.

Retica Systems, Senior Embedded HW/SW Engineer, 2004-2007 (<http://www.retica.com>)

Product definition, embedded systems design (hardware and firmware), management of contractors for biometric security camera systems that use the human iris for access control and security.

Design That Matters, Pro-bono Engineering Consultant, 2003-2005 (<http://www.designthatmatters.org>)

Electronics, PCB, embedded software design for 5W LED power controller for “Kinkajou” microfilm projector used for literacy programs in Mali. Exhibited at Cooper-Hewitt Museum, May-September 2007.

ChipWrights, Incorporated, Principal Engineer, 2001-2004 (<http://www.chipwrights.com>)

Implemented complete, auto-focus lens control sub-system for digital video camera. Hand-crafted image-processing DSP algorithms. Designed chip-to-chip interface and micro-stepping motor drive peripheral core in Verilog HDL. Implemented instruction-level simulator for parallel architecture, cycle-accurate to within 1%. Analysis to determine that video encoder could be implemented in software, shortening chip development by two months. Performed failure analysis, pinpointed elusive timing error, developed manufacturing test that significantly reduced defect rate.

Northeastern University, College of Computer Science, Full-time Adjunct Faculty, 2000-2001

Taught courses in undergraduate computer architecture and graduate-level programming language semantics.

MIT Media Laboratory, Research Specialist, 2000 (<http://media.mit.edu>)

Invented and prototyped extremely inexpensive, 2-axis inclinometer. Developed early prototype of printed, RF pressure sensors for room-sized sensing applications.

MIT Artificial Intelligence Laboratory, Amorphous Computing Group, Research Specialist, 1997

Implemented full-custom 1k x 32 SRAM, 4k x 32 ROM VLSI macro-cells for microprocessor/radio chip.

Harlequin, Incorporated, Software Engineer, 1993-1996

Implemented development and debugging tools for Dylan programming language, wrote specification of pathname library. Maintained Webmaker, a FrameMaker to HTML converter.

Thinking Machines Corporation, Member, Technical Staff, 1990-1993

Formal compiler-verification tools for testing register-allocator of Fortran compiler for SIMD architecture. Developed strategy for converting VLSI design flow from in-house CAD tools to Synopsys tool flow.

International Lisp Associates, Consultant, 1989

Working on-site in Japan, designed and implemented a compile/build utility language comparable to Lisp Machine "defsystem" and Unix “make” for Toshiba’s Common Lisp system.

ICAD, Incorporated (renamed Concentra, bought by Oracle), Software Engineer, 1984-1988

Founder. Worked on all aspects of ICAD language-based, computer-aided engineering system, including core HDL compiler technology.

MIT Laboratory for Computer Science, Research Specialist, 1984

Developed graphical user-interface tools for “NIL” Lisp system (a Common Lisp antecedent), and language extensions for Lisp Machine's object-oriented "Flavors" system.

MIT Artificial Intelligence Laboratory, Research Specialist, 1983

Developed graphical data structure inspection tools for parallel “actor” language.

Patents

Long distance multimodal biometric system and method. Identix, February 2012: US 8,121,356

Multimodal ocular biometric system. Identix, September 2011: US 8,014,571

System and Method for Interconnecting Electronic Devices Such as Integrated Circuits Into an Array. (Pending)

Publications

From turtles to Tangible Programming Bricks: Explorations in physical language design, *Personal and Ubiquitous Computing*, p. 326, v. 8, no. 5, September 2004, Springer Verlag.

The metaField Maze, *Proceedings of SIGgraph'99*, (co-authors: Bill Keays and Ron MacNiel).

Verifying the Correctness of Compiler Transformations on Basic Blocks Using Abstract Interpretation, *Proceedings of ACM PEPM'91, SIGPLAN Notices*, v. 26, No. 9, pp. 106-115, September 1991.

FORTTRAN at 14 GigaFlops: The Connection Machine Convolution Compiler, *Proceedings of ACM SIGPLAN'91 Conference on Programming Language Design and Implementation*, pp. 145-146, (co-authors: Mark Bromley, Steven Heller, and Guy Steele).

Interests

Education: Computing Explorations, Co-founder, 2011-Present (<http://www.computingexplorations.com>)

Computing Explorations is a STEM education collaborative. We work, both together and independently, on projects aimed at making computer science, robotics, and science more accessible to young learners, from grade school to high school. We have conducted trials of our techniques and curriculum materials with high school students with no programming or robotics background with great success.

Music: Rakiya, Fretless Electric Bassist, 2001-Present (<http://www.rakiya.com>)

Rakiya is an “electric Gypsy” Balkan band. We play for folk dance festivals and events, as well as the occasional night club.

Health: Yoga, 1989-Present

I have been studying and practicing yoga for years. Currently I am a student of Iyengar yoga under Peentz Dubble.