MARK ANDREW SHERMAN

Curriculum Vitae
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Ph.D. in Computer Science April 2017, University of Massachusetts Lowell
M.S. in Computer Science Dec. 2010, University of Massachusetts Lowell
B.S. in Computer Engineering May 2008, University of Massachusetts Lowell

EXPERIENCE

Emmanuel College

Assistant Professor of Computer Science
Director, Integrated Digital & Data Sciences Program

Massachusetts Institute of Technology

Postdoctoral Research Associate, MIT App Inventor   **2017 - 2018**

Research learning and teaching through various experiments concerning App Inventor. Advance learning analytics techniques and technologies for fine-grain analysis of student work in blocks languages. Co-develop research agenda for the group. Work with senior scientists and developers to design and implement data collection mechanisms at various scales. Design experiments based on existing camps and courses. Work with school teachers to co-develop courses around learning and research goals. Contribute to grant writing concerning education research. Collaborate with partners in Hong Kong for curriculum and research implementation. Write scholarly work reporting results for professional journals and conferences.

Master Trainer   **2013 - 2017**

Verizon Foundation Innovative App Challenge

Visited winning teams of national design competition, trained students and teachers in App Inventor, programming, and project management to facilitate the teams producing a functional mobile application. Prepared educational, technical, and planning documents and procedures. Followed-through with schools with technical and management support. Followed-through with media outlets for promotion of teams and their apps. Developed and led professional development workshops for teachers. Co-developed seminal work now used in Master Trainer course offered by MIT.

Projects mentored:
- HeadTek: Hardware and software solution for recording and processing head impact data with real-time data reporting to mobile devices. Suitable for football, bike riding, and other impact-wary activities. Arduino, Firebase noSQL cloud database, sensors, real-time data, mobile visualization. Pine Crest Middle School, Fort Lauderdale, FL, 2016.
- A Look Inside: App to explore inner workings of everyday devices. Provided clickable images that zoom into subcomponents with explanatory text. Utilized cloud SQL database to provide updatable list of devices, images, text, maps of click zones, traversal maps. FusionTables database, 3D modeling, custom data parser design. Upper St. Clair High School, Pittsburgh, PA, 2015.
- SnapDocs: Utilize cloud-based optical character recognition from document scanner app, provide text representation of image. Cheney Middle School, Fargo, ND, 2014.
- ChowChecker: Search for foods and display allergens present. Utilized online food databases and parsed ingredients lists. Hampstead Academy High School, Hampstead, NH, 2013.
- Recycle Bin: Identified nearby recycling centers, helped community members form new recycling initiatives. STEM Center Middle School, Fargo, ND, 2013

Open Source Developer, App Inventor   **2012 - 2017**

Developed project-specific features for App Inventor and deployed to auxiliary server instances. Helped explore direction of feature improvements, including Camera component. Developed documentation and tutorials for new features. Wrote small features and bug fixes that were merged into master project.

University of Massachusetts Lowell, Department of Computer Science

Instructor/Adjunct Professor   **2011 - 2017**

Taught courses for undergraduate CS-majors and non-majors. Responsible for course content, lecture delivery, and examinations. Manage teaching assistants, graders, and undergraduate mentors.

- *CS3010 Organization of Programming Languages:* Spring 2015, Spring 2016
- *91.101 Computing I:* Spring 2011, Fall 2011, Spring 2012, Summer 2013
- *91.113 Exploring the Internet:* Fall 2010

Guest lectured in *Robotics I* and *Organization of Programming Languages* for Profs. Yanco and Martin. Developed auto-assessment tests for entire CS1 curriculum- over 50 assignments! Supervised undergraduate research assistant in prototyping auto-assessment platform. Aided professors in developing auto-assessment tests for their courses.

Research Assistant, Middle School Pathways in Computing   **2015 - 2017**

Conducted experiments on student debugging behaviors with blocks editors. Developed assessment tools for programming and computational thinking for middle school. Supported teachers with CS content knowledge and technology for CS Infusion curriculum.

Research Assistant, Introducing Computer Science with Android   **2011 - 2014**

Developed and improved curriculum modules for undergraduate introductory computer science courses. Developed rubric for assessment of mobile programming. Developed, led, and assisted in professional development trainings, conference workshops, and seminars. Supported professors in teaching, assessing, and publishing outcomes of experimental Graphic Design/Computer Science hybrid undergraduate course.

GK-12 Fellow   **2009 - 2010**

Taught original material integrated with curriculum in high school science and mathematics classes. Worked closely with teachers, professors, and students to develop auxiliary curriculum relating classroom topics to real-world applications.

iCode After-School Instructor   **2007-2009**

Taught robotics, electronics, programming, and design to sixth through eighth grade students. Led after-school programs in middle schools. Developed curriculum modules. Worked with grade-level teachers. Led summer day camp activities. Assisted in production of robotics competitions. Designed educational electronics hardware used by students and teachers, including custom PCB design, tuned audio amplifier circuit, calibrated light sensor circuit, auto-sensing port detection, micro-controller assembly language and interpreted user code programming.

Other Duties

Linux server deployment and maintenance. Developed of UNIX-based workflow tools. Use and train others in software development workflows with git and github. Train students to use laser cutter. Provide support in electronics and compute platforms for students, staff, and professors.

Additional Experience

Bridge Program Instructor, MassBay Community College   **2012 - 2014**

Developed and taught multi-day hands-on workshops in computer science using MIT App Inventor for college-bound students. Led annual Egg Drop competition activity.

Special Course Instructor, Sun Yat-Sen University (Zhongshan University), Guangzhou, China   **July 2011**

Taught one-week intensive course on mobile robotics to senior-level software engineering students in China. Responsible for course content, equipment kit development, lecturing, and activities. Coordinated with school and foreign vendors to prepare for program. Assessed students, provided course grade for university credit.

Instructor, Indo-US Collaboration for Engineering Education, Chitkara University, India   **January 2011**

Assisted in teaching one-week intensive workshop on mobile robotics for college-level educators and professionals in India. Taught CS1 concepts with motor control, sensing, obstacle avoidance, and robot assembly.

Technology Coordinator, Office of the Regional Manager, New England FIRST Robotics   **2004 - 2005**

Mentored student robotics teams in Massachusetts and Connecticut in control software and electronics. Developed training seminar materials. Worked on committees for competition event planning.

PUBLICATIONS

Book
Derek Walter and **Mark Sherman**. (2014) *Learning MIT App Inventor: A Hands-On Guide to Building Your Own Android Apps*. Addison-Wesley Professional.

Dissertation
"Detecting Student Progress During Programming Activities by Analyzing Edit Operation on their Blocks-Based Programs," 2017.

Journals and Conferences
Evan W. Patton, **Mark Sherman**, Michael Tissenbaum. (2018) *Research Tools for MIT App Inventor*. Blocks+ Workshop at ACM SIGPLAN Systems, Programming, Languages, and Applications: Software for Humanity conference (SPLASH 2018).
Mike Tissenbaum, Mark Sherman, Joshua Sheldon, Hal Abelson. (2018) *Examining a Secondary Computational Action Curriculum Using App Inventor and Internet of Things*. Connected Learning Summit (CLS) 2018 (poster).
Mark A. Sherman, Mike Tissenbaum, Joshua Sheldon, Hal Abelson. (2018) *Tools for Computational Action: New Features in MIT App Inventor*. Tech Spotlight at Connected Learning Summit (CLS) 2018.
Tissenbaum, Sheldon, **Sherman**, Abelson, DiSalvo, DesPortes, Colyer, Nye, Nicoll, Soep, Richardson, Lee. (2018) *Making Computing Meaningful: Computational Action for Formal and Informal Computing Education*. Symposium presented at Connected Learning Summit (CLS) 2018.
Mike Tissenbaum, Josh Sheldon, Hal Abelson, **Mark Sherman**. (2018) *Examining a Secondary School Computational Action Curriculum Using App Inventor and the Internet of Things*. Int'l Conference on Computational Thinking Education (CTE2018), no. 49 (poster).
Martin, Abuah, Chakrabarty, Nguyen, **Sherman**, Schilder. (2018) *The Tablet Game: An Embedded Assessment for Measuring Students' Programming Skill in App Inventor*. P. 49th ACM Technical Symposium on Computing Science Education (SIGCSE '18), p. 1095.
Franklyn Turbak (chair), Jeff Gray, Caitlin Kelleher, **Mark Sherman**, eds. (2017) *Proceedings of the 2017 IEEE Blocks and Beyond Workshop*. IEEE Catalog CFP17E28-ART.
Ni, Schilder, **Sherman**, Martin. (2016) *Computing with a Community Focus: Outcomes from an App Inventor Summer Camp for Middle School Students*, J. Computing Sciences in Colleges, 31(6), 82-89.
Ni, **Sherman**, Schilder, Martin. (2016) *Computing with a Community Focus: An App Inventor Summer Camp for Middle School Students* (Abstract Only). P. 47th ACM Technical Symposium on Computing Science Education (SIGCSE '16), p. 690.
Mark Sherman and Fred Martin. (2015) *The Assessment of Mobile Computational Thinking*. J. Computing Sciences in Colleges, 30(6), pp. 53–59.
Martin, F. and **Sherman, M**. (2015) *A Dual-Major Course Emphasizing Computer Science and Graphic Design*. J. Computing Sciences in Colleges, 30(6), pp. 24–31.
Mark Sherman and Fred Martin. (2015) *Learning analytics for the assessment of interaction with App Inventor* (Position Statement). IEEE Blocks and Beyond Workshop.
Mark Sherman. (2015) *Process-oriented assessment of development in App Inventor* (Graduate Consortium). Visual Languages and Human-Centric Computing (VL/HCC), IEEE Symposium on, pp. 297-298.
Mark Sherman. (2014) *User models of reasoning and understanding in app inventor* (Doctoral Consortium). Proc. of the tenth annual conference on International computing education research (ICER '14), pp. 171-172.
Turbak, **Sherman**, Martin, Wolber, Pokress. (2014) *Events-First Programming in App Inventor*. J. Computing Sciences in Colleges, 29(6), pp. 81-89.
Turbak, Pokress, **Sherman**. (2014) *Mobile computational thinking with App Inventor 2* (Workshop). J. Computing Sciences in Colleges, 29(6), pp. 15-17.
Sherman, Bassil, Lipman, Tuck, Martin. *Impact of Auto-Grading on and Introductory Computing Course*. J. Computing Sciences in Colleges, 28(6), pp.69-75.
Sherman, Martin, Scribner-MacLean. (2011) *The Role of Iteration in the Design Process of Middle School Students*. In Proceedings of the 8th ACM conference on Creativity and Cognition, pp. 391-392.
Sherman. (2010) *Exploration of Natural Design Tendencies of Novice Engineers* (Masters Thesis). University of Massachusetts Lowell.

PROFESSIONAL ACTIVITY
Member, Computer Science Teachers Association, National and Greater Boston Chapter
Reviewer, Connected Learning Summit 2018
CS Ed Week and Hour of Code Advisory Committee, code.org
Research Member of CSforALL Consortium
Co-Chair, Blocks & Beyond II Workshop at VL/HCC 2017
Special Reviewer, TOCE Special Issue on Learning Analytics 2017
Reviewer, Experience Reports and Tools for SIGCSE 2018
Member ACM, SIGCSE

CONFERENCES ATTENDED
Blocks+ Workshop at ACM SIGPLAN SPLASH 2018 Boston
Connected Learning Summit (CLS) 2018 at MIT Media Lab
International Conference on Computational Thinking Education (CTE) 2018, Hong Kong
VL/HCC 2017, Blocks & Beyond II Workshop (co-chair)
ICER 2017, Work in Progress Workshop
SIGCSE 2012 - 2015
VL/HCC 2015, Blocks & Beyond Workshop, Graduate Consortium
CCSC North Eastern Conference 2012 - 2015
ICER 2014, Doctoral Consortium
ACM Creativity & Cognition 2012 at Georgia Tech, Atlanta, GA
EAAI 2011 education in artificial intelligence conference, part of AAAI-11, San Francisco, CA
Google I/O 2011 developer conference, San Francisco, CA

GRANT SUPPORT
2015-2017 NSF Middle School Pathways Grant No. 1433592. PI: Dr. Fred Martin, Molly Laden.
2011-2014 NSF Transforming Undergraduate Education through STEM, DUE-1225719 PI: Dr. Fred Martin
2009-2010 National Science Foundation GK-12 Fellowship. DGE-0841392 PI: Dr. Kavitha Chandra
2007-2009 National Science Foundation iTest. DRL-0624669 PI: Dr. Fred Martin