

Aaron D. Adler

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Education

MASSACHUSETTS INSTITUTE OF TECHNOLOGY Cambridge, MA
Ph.D. in Computer Science and Electrical Engineering June 2009
Thesis: Multimodal Bidirectional Dialogue System
Advisor: Prof. Randall Davis
Committee Members: Dr. James Glass, Prof. Robert C. Miller
Minor: Political Science

M.Eng. in Computer Science and Engineering January 2003
Thesis: Segmentation and Alignment of Speech and Sketching in a Design Environment
Supervisors: Prof. Randall Davis, Dr. Howard Shrobe

S.B. in Computer Science June 2001
Eta Kappa Nu Member -- Undergraduate Computer Science Honor Society

Experience

RAYTHEON BBN TECHNOLOGIES Cambridge, MA
Scientist July 2009-present

- Designed and implemented a “crumple-zone” as part of a team for an AFRL-funded project. The crumple-zone is designed to defend web services from attacks.
- Designed and implemented parts of a tool-chain for synthetic biology.
- Designed and implemented parts of a design tool for redesign of robotic systems. Also a co-PI for the DARPA-funded project.
- Designed and implemented URL classifier to evaluate potentially malicious URLs as part of the Behavior-Based Access Control security project. Investigated data available from current monitoring systems (i.e. HBSS).
- Helped refine the QuaFL quantum programming language and converted algorithms from specifications to QuaFL code.
- Selected for and completed Principle Investigator Program.
- Wrote and reviewed many funded proposals.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY Cambridge, MA
Computer Science and Artificial Intelligence Laboratory September 2001-June 2009
Research Assistant

Multimodal Dialogues, 2003-2009

- Creating a more natural computer interface by combining speech and sketching.
- Conducting user studies and evaluating data on multimodal dialogues.

- Developing a multimodal bidirectional speech and sketching dialogue system to study user / system interaction. The system and user will both use speech and sketching to describe simple mechanical devices.
- Created a new data format for sketches that is currently used in other research groups.

Intelligent Room Group, 2001-2003

- Developed applications for agent based intelligent room. The intelligent room contains many sensors, projectors, microphones, and computers.
- Focused on ASSIST sketch recognition system and added simple speech recognition capabilities to the system.

NOKIA RESEARCH CENTER

Burlington, MA

Software Engineer

Summer 2003

- Designed client/server software for mobile phones to enable users to run code on a central server.
- Allowed bypass of cell phone carrier restrictions of phone software.
- Investigated security implications of the research project.

NOKIA RESEARCH CENTER

Burlington, MA

Software Engineer

June 2001- April 2002

- Designed, implemented, and tested software (in C) for a multi-platform, multi-protocol, instant messaging application.
- Developed specifications for Wireless Village instant messaging initiative.
- Utilized several message protocols and coordinated with several phone providers.

MADETOORDER.COM

Framingham, MA

Associate Software Engineer

Summer 2000

- Researched, designed, and developed new user interface features for the e-commerce website.
- Coordinated design work with sales group enabling streamlined operations.
- Developed user interface and backend implementation of web pages.
- Project saved company \$500,000 annually.

BBN TECHNOLOGIES

Cambridge, MA

Software Engineer

Summer 1999

- Designed and implemented an airframe scheduling component as part of a DARPA-funded military supply tracking research project.
- Built test platform for other system components.
- Programmed extensively in Java, Perl, and with XML files and parsing.

MIT MAN VEHICLE LAB

Cambridge, MA

Undergraduate Research Assistant

Spring 1999

- Utilized Head Mounted Displays (HMDs) for a NASA-funded research project examining a virtual reality environment that could be used on the space station.
- Developed code to allow the eye-tracker in the HMDs to communicate over a serial port with the 3D modeling software.

BBN INTERNETWORKING / GTE

Cambridge, MA

Year 2000 Tester

Summer 1998

- Devised test cases and wrote scripts to certify products as Year 2000 compliant.
- Executed tests and authored reports assessing the compliance of the products.
- Tested products included routers, operating systems, and software programs.

Teaching Experience

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Department of Electrical Engineering and Computer Science

Cambridge, MA
Fall 2004

Teaching Assistant, Programming Languages

- Assisted students with homework problems and material they found difficult to understand.
- Led exam review sessions and developed exams.
- Updated problem sets and course webpage.
- Graded problem sets in coordination with another Teaching Assistant.

Refereed Publications

Beal, Jacob; Weiss, Ron; Densmore, Douglas; **Adler, Aaron**; Appleton, Evan; Babb, Jonathan; Bhatia, Swapnil; Davidsohn, Noah; Haddock, Traci; Loyall, Joseph; Schantz, Richard; Vasilev, Viktor; and Yaman, Fusun. "An End-to-End Workflow for Engineering of Biological Networks from High-Level Specifications." *ACS Synthetic Biology*, online publication. July 2012.

Yaman, Fusun; Bhatia, Swapnil; **Adler, Aaron**; Densmore, Douglas; and Beal, Jacob. "Automated Selection of Synthetic Biology Parts for Genetic Regulatory Networks." *ACS Synthetic Biology*, online publication. July 2012.

Beal, Jacob; Mostafa, Hala; Axelrod, Benjamin; Mozeika, Annan; **Adler, Aaron**; Markiewicz, Gretchen; and Usbeck, Kyle. "A Manifold Operator Representation for Adaptive Design." In *Proceedings of the Fourteenth International Conference on Genetic and Evolutionary Computation Conference (GECCO)*. July 2012, pp. 529-536.

Beal, Jacob; Weiss, Ron; Densmore, Douglas; **Adler, Aaron**; Appleton, Evan; Babb, Jonathan; Bhatia, Swapnil; Davidsohn, Noah; Haddock, Traci; Loyall, Joseph; Schantz, Richard; Vasilev, Viktor; and Yaman, Fusun. "Results from TASBE." In *4th International Workshop on Bio-Design Automation (IWBD)*. June 2012.

Adler, Aaron; Yaman, Fusun; Cleveland, Jeffrey; and Beal, Jacob. "Morphogenetically Assisted Design Variation." In *2nd International Conference on Morphological Computation*. Venice, Italy, September 2011, pp 106-108.

Beal, Jacob; Weiss, Ron; Densmore, Douglas; **Adler, Aaron**; Babb, Jonathan; Bhatia, Swapnil; Davidsohn, Noah; Haddock, Traci; Yaman, Fusun; Schantz, Richard; and Loyall, Joseph. "TASBE: A Tool-Chain to Accelerate Synthetic Biological Engineering." In *3rd International Workshop on Bio-Design Automation (IWBD)*. June 2011.

Yaman, Fusun; Bhatia, Swapnil; **Adler, Aaron**; Densmore, Douglas; Beal, Jacob; Weiss, Ron; and Davidsohn, Noah. "Toward Automated Selection of Parts for Genetic Regulatory Networks." In *3rd International Workshop on Bio-Design Automation (IWBD)*. June 2011.

Vasilev, Viktor; Liu, Chenkai; Haddock, Traci; Bhatia, Swapnil, **Adler, Aaron**; Yaman, Fusun; Beal, Jacob; Babb, Jonathan; Weiss, Ron; and Densmore, Douglas. "A Software Stack for Specification and Robotic Execution of Protocols for Synthetic Biological Engineering." In *3rd International Workshop on Bio-Design Automation (IWBD)*. June 2011.

Atighetchi, Michael; Pal, Partha; **Adler, Aaron**; Gronosky, Andrew; Yaman, Fusun; Webb, Jonathan; Loyall, Joseph; Sinclair, Asher; and Payne, Charles. "Crumple Zones: Absorbing Attack Effects Before They Become a Problem." In *CrossTalk - The Journal Of Defense Software Engineering, Special Issue on Rugged Software*. March/April 2011, pp. 4-11.

Adler, Aaron. "Reasoning About Sketches Using Context, Domain Knowledge, and Interaction with the User." In *Visual Representations and Reasoning: A Workshop of the 24th AAAI Conference on Artificial Intelligence (AAAI-10)*. Atlanta, Georgia, July 11, 2010.

Adler, Aaron. "Symmetric Multimodal Dialogues." In *SkCHI: Designing Sketch Recognition Interfaces: A CHI 2010 Workshop*. Atlanta, Georgia, April 10, 2010.

Hammond, Tracy; Lank, Edward; and **Adler, Aaron**. "SkCHI: Designing Sketch Recognition Interfaces." In *Proceedings of CHI 2010 (Extended Abstracts)*. Atlanta, Georgia, April 10-15, 2010.

Bischel, David; Stahovich, Thomas; Peterson, Eric; Davis, Randall; and **Adler, Aaron**. "Combining Speech and Sketch to Interpret Unconstrained Descriptions of Mechanical Devices." In *Proceedings of the 2009 International Joint Conference on Artificial Intelligence (IJCAI)*, pp. 1401-1406. Pasadena, California, July 2009.

Adler, Aaron and Davis, Randall. "Symmetric Multimodal Interaction in a Dynamic Dialogue." In *2009 Intelligent User Interfaces Workshop on Sketch Recognition*. Sanibel Island, Florida, February 2009.

Adler, Aaron and Davis, Randall. "Speech and Sketching: An Empirical Study of Multimodal Interaction." In *Proceedings of Fourth Eurographics Conference on Sketch Based Interfaces and Modeling*. Riverside, California, August 2-3 2007.

Adler, Aaron; Eisenstein, Jacob; Olthmans Michael; Guttentag, Lisa; and Davis, Randall. "Building the Design Studio of the Future." In *Proceedings of AAAI Fall Symposium: Making Pen-Based Interaction Intelligent and Natural*, pp.1-7. Menlo Park, California, October 21-24 2004.

Adler, Aaron and Davis, Randall. "Speech and Sketching for Multimodal Design." In *Proceedings of the 9th International Conference on Intelligent User Interfaces*, pp. 214--216. ACM Press, 2004.

Oh, Alice; Fox, Harold; Van Kleek, Max; **Adler, Aaron**; Gajos, Krzysztof; Morency, Louis-Philippe, Morency; and Darrell, Trevor. "Evaluating Look-to-Talk: A Gaze-Aware Interface in a Collaborative Environment." *ACM SIGCHI* 2002.

Other Publications

Beal, Jacob; Weiss, Ron; Yaman, Fusun; Davidsohn, Noah; and **Adler, Aaron**. "A Method for Fast, High-Precision Characterization of Synthetic Biology Devices." *MIT CSAIL Tech Report 2012-008*. April 2012.

Galdzicki, Michal; Wilson, Mandy L.; Rodriguez, Cesar A.; Pockock, Matthew R.; Oberortner, Ernst; Adam, Laura; **Adler, Aaron**; Anderson, J. Christopher; Beal, Jacob; Chandran, Deepak; Densmore, Douglas; Drory, Omri A.; Endy, Drew; Gennari, John H.; Grünberg, Raik; Ham, Timothy S.; Hillson, Nathan J.; Johnson, Jeffrey D.; Kuchinsky, Allan; Lux, Matthew W.; Madsen, Curtis; Misirli, Goksel; Myers, Chris J.; Peccoud, Jean; Plahar, Hector; Platt, Darren; Roehner, Nicholas; Sirin, Evren; Smith, Trevor F.; Stan, Guy-Bart; Villalobos, Alan; Wipat, Anil; and Sauro, Herbert M. "Synthetic Biology Open Language (SBOL) Version 1.1.0." BioBricks Foundation Request for Comments (BBF RFC) #87. March 2012.

Beal, Jacob; Weiss, Ron; Densmore, Douglas; **Adler, Aaron**; Babb, Jonathan; Bhatia, Swapnil; Davidsohn, Noah; Haddock, Traci; Yaman, Fusun; Schantz, Richard; and Loyall, Joseph. "A Tool-Chain to Accelerate Synthetic Biological Engineering." *Abstract in SB5.0: the Fifth International Meeting on Synthetic Biology*. June 2011.

Yaman, Fusun; Bhatia, Swapnil; **Adler, Aaron**; Babb, Jonathan; Beal, Jacob; Davidson, Noah; Densmore, Douglas; Haddock, Traci; Loyall, Joseph; Schantz, Richard; and Weiss, Ron. "Toward Automated Selection of Parts for Genetic Regulatory Networks." *Abstract in SB5.0: the Fifth International Meeting on Synthetic Biology*. June 2011.

Yaman, Fusun; Bhatia, Swapnil; **Adler, Aaron**; Densmore, Douglas; Beal, Jacob; Babb, Jonathan; Davidson, Noah; Haddock, Traci; Loyall, Joseph; Schantz, Richard; and Weiss, Ron. "Toward Automated Selection of Parts for Genetic Regulatory Networks." *Abstract in IBE 2011*. March 2011.

Adler, Aaron Daniel. "MIDOS: Multimodal Interactive DialOgue System." Ph.D. Thesis for Massachusetts Institute of Technology. June 2009.

Adler, Aaron. "Multimodal Interactive Digital Whiteboard." Ph.D. Thesis Proposal. MIT, Cambridge, MA. February 2007.

Adler, Aaron. "Segmentation and Alignment of Speech and Sketching in a Design Environment." Master's Thesis. MIT, Cambridge, MA. February 2003.

Eisenstein, Jacob; **Adler, Aaron**; Guttentag, Lisa. "A Trimodal Dialogue Corpus: Speech, Gesture, and Sketching." In *Fourth Annual MIT CSAIL Student Oxygen Workshop*, September 2004.

Adler, Aaron. "Creating a Multimodal Design Environment Using Speech and Sketching." In *MIT Student Oxygen Workshop*, September 2003.

Adler, Aaron and Davis, Randall. "Using Speech and Sketching in a Design Environment." MIT Computer Science and Artificial Intelligence Laboratory Annual Research Abstract. February 2004.

Adler, Aaron; Davis, Randall; and Shrobe, Howard. "Mutual Disambiguation of Verbal and Sketching Inputs in a Design Environment." MIT Artificial Intelligence Laboratory Annual Abstract. September 2002.

Davis, Randall; **Adler, Aaron**; Alvarado, Christine; Hammond, Tracy; Hitchcock, Rebecca; Oltmans, Michael; Sezgin, Tevfik Metin; and Veselova, Olya. "Designs for the Future." MIT Artificial Intelligence Laboratory Annual Abstract. September 2002.

Invited Talks

Adler, Aaron. "A Tool-Chain Approach to Predictive Design of Biological Circuits." *Biological Systems Design SIG at International Society for Computational Biology (ISCB)*. Long Beach, CA, July 13, 2012.

Professional Service

BBN SDP Seminar Series on AI, Co-Organizer	2012-
SBOL Visual Leader	2012-
BBN Mentor	2012
IWBDA 2012, Co-Finance Chair	2012
Sketch Recognition Workshop at IUI 2011, Co-Chair	2011
SkCHI: Designing Sketch Recognition Interfaces: A CHI 2010 Workshop, Assistant Chair	2010

IUI Workshop on Sketch Recognition, Program Committee

2009

Leadership

CSAIL Reading Room Committee

2007

Graduate student representative on committee that evaluated the lab reading room; wrote a consensus report about the future of the lab reading room.

CSAIL Student Committee Member, Treasurer

2005-2006

Elected by peers to serve on the committee, and then elected by the committee to serve as treasurer. The committee distributes money to students for various activities and meets with lab director to provide feedback and input on lab-wide issues. The committee also organizes events and services for the graduate students.

CSAIL Student Workshop Chair

2005

Organized off-site workshop for 100 CSAIL graduate students. Expanded focus of workshop to encompass activities of all of CSAIL. Organized and oversaw transportation, food, venue, event sponsorship, and budget. Delegated tasks to other graduate students.

Dorm President

2000

Elected by dorm residents. Organized meetings. Represented Dorm at Dormitory Council meetings. Recipient of MacGregor House Dormitory Outstanding Service Award (2001).

Computer Skills

Programming experience in a variety of languages including Java, Perl, Scheme, C, C#, Python, HTML, Matlab.

Experience on a variety of platforms: Tablet PCs, Windows, Macintosh, and Linux.

Maintained research group's website and servers at CSAIL.

Last updated: July 12, 2012