

# Erin T. Solovey

Department of Computer Science  
Worcester Polytechnic Institute  
100 Institute Road, Worcester, MA 01609

# Curriculum Vitae

<http://users.wpi.edu/~esolovey>  
esolovey@wpi.edu

## RESEARCH INTERESTS

---

Human-Computer Interaction, Machine Learning, Brain-Computer Interfaces, Accessibility, Novel Interaction Modes & Techniques, Adaptive User Interfaces, Physiological and Wearable Computing, Human Interaction with Artificial Intelligence Systems and Vehicles.

## EDUCATION

---

<b>MIT, Cambridge, MA</b>	CSAIL, AeroAstro, Humans & Automation Lab	Postdoctoral Fellow	2011- 2013
<b>Tufts University, Medford, MA</b>	Computer Science	Ph.D.	2012
<b>Tufts University, Medford, MA</b>	Computer Science	M.S.	2007
<b>Harvard University, Cambridge, MA</b>	Computer Science	A.B.	2001

## EMPLOYMENT

---

<b>Worcester Polytechnic Institute, Worcester, MA</b> <i>Assistant Professor of Computer Science</i> Affiliated Interdisciplinary Programs: Neuroscience, Bioinformatics & Computational Biology, Learning Sciences & Technologies, Robotics Engineering, Interactive Media & Game Development	<b>2018-present</b>
<b>Drexel University, Philadelphia, PA</b> <i>Assistant Professor of Computer Science, College of Computing &amp; Informatics</i> <i>Director, Advanced Interaction Research Lab</i> <i>Affiliated Research Assistant Professor, School of Biomedical Engineering, Science and Health Systems</i>	<b>2014-2018</b>
<b>Massachusetts Institute of Technology, Cambridge, MA</b> <i>NSF/CRA Computing Innovation Postdoctoral Fellow, Humans &amp; Automation Lab, Postdoctoral Mentor: Dr. Mary (Missy) Cummings</i>	<b>2011-2013</b>
<b>Tufts University Computer Science Department, Medford, MA</b> <i>Graduate Research Assistant, Human-Computer Interaction Lab</i> Advisor: Dr. Robert Jacob	<b>2005-2011</b>
<b>Bluefin Labs (acquired by Twitter), Cambridge, MA</b> <i>User Interface Design &amp; Development</i>	<b>Summer, 2010</b>
<b>Microsoft Research, Redmond, WA</b> <i>Research Intern, Mentors: Desney Tan, Dan Morris</i>	<b>Summer, 2008</b>
<b>Boston Museum of Science, Boston, MA</b> <i>Technical Intern for Exhibit Development</i>	<b>2007-2008</b>
<b>MIT Lincoln Laboratory, Lexington, MA</b> <i>Graduate Research Program</i>	<b>Summer, 2006</b>
<b>Oracle Corporation, Redwood Shores, CA and Burlington, MA</b> <i>Senior Applications Engineer, Oracle Learning Architecture</i>	<b>2001-2005</b>
<b>Oracle Corporation, Redwood Shores, CA</b> <i>Summer Intern, Manufacturing Applications</i>	<b>Summer, 2000</b>

Sun Microsystems, Cupertino, CA  
Summer Intern, Java Software Division, Web Engineering

Summer, 1999

Planet Direct / MyWay.com (A CMGI Company), Andover, MA  
Java Component Development Team Intern

Summer, 1998

## PUBLICATIONS

---

### Refereed Full Conference Papers

- [C.24] De Carli, L., Ray, I., **Solovey, E.T.** (2021). Vision: Stewardship of Smart Devices Security for the Aging Population. In *Proc. ACM EuroUSEC '21: European Symposium on Usable Security*. 9 pages.
- [C.23] McDonald, D.Q., Vallet, R., **Solovey, E.**, Dion, G., Shokoufandeh, A. (2020). Knitted Sensors: Designs and Novel Approaches for Real-Time, Real-World Sensing. In *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) and Ubicomp 2021*, 4 (4), Article 145, 25 pages.
- [C.22] Unal, D., Arrington, K., **Solovey, E.**, Walker, E. (2020). Using Thinkalouds to Understand Rule Learning and Cognitive Control Mechanisms within an ITS. In *Proc. International Conference of Artificial Intelligence in Education (AIED)*. [Acceptance Rate: 26.6%]
- [C.21] Li, Z., Lei, Z., Yan, A., **Solovey, E.**, Pahlavan K. (2020). ThuMouse: A Micro-gesture [Cursor Input through mmWave Radar-based Interaction. In *Proc. IEEE ICCE International Conference on Consumer Electronics*, Las Vegas, NV, USA
- [C.20] **Solovey, E.T.**, Powale, P., Cummings, M.L. (2017). A Field Study of Multimodal Alerts for an Autonomous Threat Detection System. In *Proc. Human-Computer Interaction International Conference* (pp. 393-412). Springer.
- [C.19] Chan, J., Siangliulue, P., McDonald, D.Q., Liu, R., Moradinezhad, R., Aman, S., **Solovey, E.T.**, Gajos K. & Dow, S.P. (2017). Semantically Far Inspirations Considered Harmful? Accounting for Cognitive States in Collaborative Ideation. In *Proc. of 2017 ACM Conference on Creativity and Cognition*. (pp. 93-105). ACM. [Acceptance Rate: 28.9%].
- [C.18] Tucker, F., **Solovey, E. T.**, Geib, C., Lee, F. (2016). Veneer: A Digital Visual Novel Game Exploring Player Empathy. In *Proc. Meaningful Play*. East Lansing, MI.
- [C.17] **Solovey, E.T.**, Okerlund, J., Hoef, C., Davis, J., Shaer, O. (2015). Augmenting Spatial Skills with Semi-Immersive Interactive Desktop Displays: Do Immersion Cues Matter? In *Proc. Augmented Human International Conference*. (pp. 53-60). ACM.
- [C.16] **Solovey, E.T.**, Zec, M., Garcia Perez, E., Reimer, B., Mehler, B. (2014). Classifying Driver Workload Using Physiological and Driving Performance Data: Two Field Studies. In *Proc. ACM Conference on Human Factors in Computing Systems CHI '14*. (pp. 4057-4066). ACM. **Best Paper Award Honorable Mention**. [Awarded to top 5%]
- [C.15] Afergan, D., Peck, E.M., **Solovey, E.T.**, Jenkins, A., Hincks, S.W., Brown, E.T., Chang, R., Jacob, R.J.K. (2014). Dynamic Difficulty Using Brain Metrics of Workload. In *Proc. ACM Conference on Human Factors in Computing Systems CHI '14*. (pp. 3797-3806). ACM. **Best Paper Award Honorable Mention**. [Awarded to top 5%]
- [C.14] Berardi, C., **Solovey, E.T.**, Cummings, M.L. (2013). Investigating the Efficacy of Network Visualizations for Intelligence Tasks. In *Proc. of 2013 IEEE International Conference on Intelligence and Security Informatics (ISI)*, (pp. 278-283). IEEE.
- [C.13] Mkrtychyan, A., Macbeth, J., **Solovey, E.T.**, Ryan, J., Cummings, M.L. (2012). Using Variable-Rate Alerting to Counter Boredom in Human Supervisory Control. In *Proc. Human Factors and Ergonomics Society Annual Meeting*, (Vol. 56, No. 1, pp. 1441-1445). Sage CA: Los Angeles, CA: Sage Publications.
- [C.12] **Solovey, E.T.**, Schermerhorn, P., Scheutz, M., Sassaroli, A., Fantini, S., Jacob, R.J.K. (2012). Brainput: Enhancing Interactive Systems with Streaming fNIRS Brain Input. In *Proc. ACM Conference on Human Factors in Computing Systems CHI'12*. (pp. 2193-2202). ACM. **Best Paper Award Honorable Mention**. [Awarded to top 5%].
- [C.11] **Solovey, E.T.**, Chauncey, K., Lalooses, F., Parasi, M., Weaver, D., Scheutz, M.,

Schermerhorn, P., Sassaroli, A., Fantini, S., Girouard, A., Jacob, R.J.K. (2011). Sensing Cognitive Multitasking for a Brain-Based Adaptive User Interface. *Proc. ACM Conference on Human Factors in Computing Systems CHI'11*, (pp. 383-392). ACM. [Acceptance Rate: 26%].

- [C.10] **Solovey, E.T.**, Girouard, A., Chauncey, K., Hirshfield, L.M., Sassaroli, A., Zheng, F., Fantini, S., Jacob, R.J.K. (2009). Using fNIRS Brain Sensing in Realistic HCI Settings: Experiments and Guidelines. *ACM UIST 2009 Symposium on User Interface Software and Technology*, (pp. 157-166). ACM. [Acceptance Rate: 18%].
- [C.9] **Solovey, E.T.** Using Your Brain for Human-Computer Interaction. (2009). Doctoral Consortium, *ACM UIST 2009 Symposium on User Interface Software and Technology*. ACM.
- [C.8] Hirshfield, L.M., **Solovey, E.T.**, Girouard, A., Kebinger, J., Jacob, R.J.K., Sassaroli, A., Fantini, S. (2009). Brain Measurement for Usability Testing and Adaptive Interfaces: An Example of Uncovering Syntactic Workload with Functional Near Infrared Spectroscopy. *Proc. ACM Conference on Human Factors in Computing Systems CHI'09*. (pp. 2185-2194). ACM. [Acceptance Rate: 24.5%].
- [C.7] Horn, M.S., **Solovey, E.T.**, Crouser, R.J., & Jacob, R.J.K. (2009). Comparing the Use of Tangible and Graphical Programming Languages for Informal Science Education. *Proc. ACM Conference on Human Factors in Computing Systems CHI'09*, (pp. 975-984). ACM. [Acceptance Rate: 24.5%].
- [C.6] Girouard, A., **Solovey, E.T.**, Hirshfield, L.M., Chauncey, K., Sassaroli, A., Fantini, S., & Jacob, R.J.K. (2009). Distinguishing Difficulty Levels with Non-invasive Brain Activity Measurements. *Proc. INTERACT 2009 Conference*, (pp. 440-452). Springer. [Acceptance Rate 29%].
- [C.5] Hirshfield, L.M., Chauncey, K., **Solovey, E.T.**, Girouard, A., Jacob, R., Sassaroli, A., & Fantini, S. (2009). Combining Electroencephalograph and Near Infrared Spectroscopy to Explore Users' Instantaneous and Continuous Mental Workload States. *HCI International 2009 13th International Conference on Human-Computer Interaction*, Springer.
- [C.4] Sassaroli, A., Zheng, F., Coutts, M., Hirshfield, L.M., Girouard, A., **Solovey, E.T.**, Jacob, R.J.K., Tong, Y., Frederick, B. deB., Fantini, S. (2009). Application of Near-Infrared Spectroscopy for Discrimination of Mental Workloads, *SPIE Proceedings 7174*.
- [C.3] Horn, M.S., **Solovey, E. T.**, Jacob, R.J.K. (2008). Tangible Programming and Informal Science Learning: Making TUIs Work for Museums. *Proc. of Interaction Design and Children*, (pp. 194-201). ACM.
- [C.2] Jacob, R.J.K., Girouard, A., Hirshfield, L.M., Horn, M.S., Shaer, O., **Solovey, E.T.**, & Zigelbaum, J. (2008). Reality-Based Interaction: A Framework for Post-WIMP Interfaces. *Proc. ACM CHI 2008 Human Factors in Computing Systems Conference*, (pp. 201-210). ACM. [Acceptance Rate: 22%]
- [C.1] Girouard, A., **Solovey, E.T.**, Hirshfield, L., Ecott, S., Shaer, O., & Jacob, R.J.K. Smart Blocks: A Tangible Mathematical Manipulative. *Proc. TEI 2007 First International Conference on Tangible and Embedded Interaction*, (pp. 183-186). ACM.

### Journal Articles

- [J15] **Solovey, E.T.**, Putze, F. (2021). Improving HCI with Brain Input: Review, Trends, and Outlook. *Foundations and Trends in Human-Computer Interaction*, Vol. 13: No. 4, pp298-379.
- [J14] R. Moradinezhad, R., **E.T. Solovey**, Investigating Trust in Interaction with Inconsistent Embodied Virtual Agents. *International Journal of Social Robotics (SORO)*. 16 pages.
- [J13] Liu, R., Reimer, B., Song, S., Mehler, B., **Solovey, E.T.** (2020). Unsupervised fNIRS feature extraction with CAE and ESN autoencoder for driver cognitive load classification. In *Journal of Neural Engineering*, 18, 036001. 15 pages.
- [J.12] **E.T. Solovey**, K.J. Ryan, M. Cummings. (2020). CODA: Mobile Interface for Enabling Safer Navigation of Unmanned Aerial Vehicles in Real-World Settings. *International Journal of Human-Computer Studies* (To Appear)
- [J.11] Liu, R., Walker, E., Friedman, L., Arrington, C.M., **Solovey, E.T.** (2020). fNIRS-based Classification of Mind-wandering with Personalized Window Selection for Multimodal Learning Interfaces. *Journal on Multimodal User Interfaces*.

- [J.10] Pahlavan, K., Ying, J., Li, Z., **Solovey, E.**, Loftus, J., Dong, Z. (2020). RF Cloud for Cyberspace Intelligence. *IEEE Access* 8: 89976-89987.
- [J.9] Girouard, A., Shaer, O., **Solovey, E.T.**, Poor, M., Jacob, R.J.K. (2019). The Reality of Reality-Based Interaction: Understanding the Impact of a Framework as a Research Tool. *ACM Transactions on Computer-Human Interaction (TOCHI)*, 26, 5, Article 35, 35 pages.
- [J.8] Jacucci, G., Fairclough, S., & **Solovey, E. T.** (2015). Physiological Computing. *IEEE Computer*, 48(10), 12-16.
- [J.7] Belyusar, D., Mehler, B., **Solovey, E.T.** & Reimer, B. (2015). The Impact of Repeated Exposure to a Multi-Level Working Memory Task on Physiological Arousal and Driving Performance. *Transportation Research Record: Journal of Transportation Research Board*. No. 2518, 46-53.
- [J.6] Boyer, M., Cummings, M.L., Spence, L.B., **Solovey, E.T.** (2015). Investigating Mental Workload Changes in a Long Duration Supervisory Control Task. *Interacting With Computers*, 27(5), 512-520.
- [J.5] **Solovey, E.T.**, Afergan, D., Peck, E.M., Hincks, S.W., Jacob, R.J.K. (2015). Designing Implicit Interfaces for Physiological Computing: Guidelines and Lessons Learned using fNIRS. *ACM Transactions on Computer-Human Interaction (TOCHI)*. 21(6), 35.
- [J.4] Gao, F., Cummings, M.L., **Solovey, E.T.** (2014). Modeling Teamwork in Supervisory Control of Multiple Robots. *IEEE Transactions on Human-Machine Systems*. 44(4), 441-453.
- [J.3] Girouard, A., **Solovey, E.T.**, & Jacob, R.J.K. (2013). Designing a Passive Brain Computer Interface using Real Time Classification of Functional Near-Infrared Spectroscopy. *International Journal of Autonomous and Adaptive Communications Systems*, 6(1), 26-44.
- [J.2] Peck, E. M., **Solovey, E.T.**, Chauncey, K., Sassaroli, A., Fantini, S., Girouard, A., Hirshfield, L.M., Jacob, R.J.K. (2010). Your Brain, Your Computer, and You. *IEEE Computer*, 43(12), 86-89.
- [J.1] Sassaroli, A., Zheng, F., Hirshfield, L.M., Girouard, A., **Solovey, E.T.**, Jacob, R.J.K., & Fantini, S. (2008). Discrimination of Mental Workload Levels in Human Subjects with Functional Near-Infrared Spectroscopy. *Journal of Innovative Optical Health Sciences*, 1(2), 227-237.

#### **PhD Dissertation**

- [D.1] **Solovey, E.T.** (2012). Real-time fNIRS Brain Input for Enhancing Interactive Systems. Ph.D. Dissertation, Computer Science Department, Tufts University, Medford, MA.

#### **Book Chapters**

- [B.2] Gao, F., Cummings, M.L., **Solovey, E.T.** (2016). Designing for Robust and Effective Teamwork in Human-Agent Teams. in *The Intersection of Robust Intelligence (RI) and Trust in Autonomous Systems*, Ed.: W. Lawless, (pp. 167-190). Springer US.
- [B.1] Girouard, A., **Solovey, E.T.**, Hirshfield, L., Peck, E., Chauncey, K., Sassaroli, A., Fantini, S., & Jacob, R.J.K. (2010). From Brain Signals to Adaptive Interfaces: Using fNIRS in HCI. in *Brain-Computer Interfaces: Applying our Minds to Human-Computer Interaction*, ed. by A. Nijholt, pp. 221-237, Springer.

#### **Poster Presentations (Peer Reviewed)**

- [P.13] Boll, R., Mahajan, Reis, J., **Solovey, E.T.** (2020). Creating questionnaires that align with ASL linguistic principles and cultural practices within the Deaf community. In *Proceedings of the 22nd International ACM SIGACCESS Conference on Computers and Accessibility*. ACM.
- [P.12] Keating, S., Walker, E., Motupali, A., **Solovey, E.T.** (2016). Toward Real-time Brain Sensing for Learning Assessment: Building a Rich Dataset. In *Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems* (pp. 1698-1705). ACM.
- [P.11] Reis, J., **Solovey, E.T.**, Henner, J., Johnson, K., Hoffmeister, R. (2015). ASL CLear: STEM Education Tools for Deaf Students. In *Proceedings of the 17th International ACM SIGACCESS Conference on Computers & Accessibility* (pp. 441-442). ACM.
- [P.10] Belyusar, D., Reimer, B., Mehler, B., Afergan, D., Coughlin, J.F., **Solovey, E.T.** (2014). Utilizing functional near-infrared spectroscopy to identify cognitive processes contributing

to workload in a dual-task environment. *Society for Neuroscience Annual Meeting*, Washington, D.C.

- [P.9] Hoef, C., Davis, J., Shaer, O., **Solovey, E.T.** (2014). An In-Depth Look at the Benefits of Immersion Cues on Spatial 3D Problem Solving. In *Proc. ACM Symposium on Spatial User Interfaces*, (pp. 157-157). ACM.
- [P.8] **Solovey, E.T.**, Mehler, B., Reimer, B. (2012). Brain Sensing with fNIRS in the Car. In *Adjunct Proc. of International Conference on Automotive User Interfaces and Interactive Vehicular Applications (AutoUI)*, Portsmouth, NH.
- [P.7] **Solovey, E.T.**, Jackson, K., Cummings, M.L. (2012). Collision Avoidance Interface for Safe Piloting of Unmanned Vehicles using a Mobile Device. In *Adjunct Proc. ACM UIST 2012 Symposium on User Interface Software and Technology*, (pp. 77-78). ACM.
- [P.6] Peck, E., **Solovey, E.T.**, Su, S., Jacob, R.J.K., & Chang, R. (2011). Near to the brain: Functional near-infrared spectroscopy as a lightweight brain imaging technique for visualization, *Proc. IEEE Conference on Information Visualization*. **Best Poster Award**
- [P.5] **Solovey, E.T.**, Jacob, R.J.K. (2010). Using fNIRS to Support User Interfaces. In *Proc. fNIRS Conference*, Cambridge, MA.
- [P.4] Sassaroli, A., Zheng, F., Girouard, A., **Solovey, E.T.**, Chauncey, K., Hirshfield, L.M., Peck, E., Jacob, R.J.K., & Fantini, S. (2010). Application of correlation analysis tools for the classification of mental workloads in functional near-infrared spectroscopy. In *Proc. BIOMED OSA Topical Meeting*.
- [P.3] Sassaroli, A., Tong, Y., Hirshfield, L.M., Girouard, A., **Solovey, E.T.**, Jacob, R.J.K. & Fantini, S. (2008). Real-time assessment of mental workload with near infrared spectroscopy: potential for human-computer interaction. In *Proc. BIOMED, OSA topical meeting*, St. Petersburg Bayfront, FL.
- [P.2] Hirshfield, L.M., Girouard, A., **Solovey, E.T.**, Jacob, R.J.K., Sassaroli, A., Tong, Y., & Fantini, S. (2007). Human-Computer Interaction and Brain Measurement Using Functional Near-Infrared Spectroscopy. In *Adjunct Proc. ACM UIST 2007 Symposium on User Interface Software and Technology*, ACM.
- [P.1] Jacob, R.J.K., Girouard, A., Hirshfield, L.M., Horn, M.S., Shaer, O., **Solovey, E.T.**, & Zigelbaum, J. (2007). Reality-Based Interaction: Unifying the New Generation of Interaction Styles. In *ACM CHI 2007 Human Factors in Computing Systems Conference Extended Abstracts*, pp. 2465-2470, ACM.

### Workshop Papers (Peer Reviewed)

- [W.21] Micek, C., Guan, Z., **Solovey, E.T.** (2021). Toward Understanding Effects of Digital Jury Moderation on the Polarization of Social Media Users. In *Proc. CHI 2021 Workshop in Search of the Alternative Future: Developing Participatory Digital Citizenship to Address the Crisis of Democracy*.
- [W.20] De Carli, L., Ray, I., **Solovey E.T.** (2020). Enabling IoT Residential Security Stewardship for the Aging Population. In *Proc. CHI 2020 Workshop on Designing Interactions for the Ageing Populations - Addressing Global Challenges*.
- [W.19] Moradinezhad, R., **Solovey, E.** (2020). Embodied Conversational Agent Behavior and its Impact on Trust in Other Agents. *Proc. of CUI@CHI: Mapping Grand Challenges for the Conversational User Interface Community CHI 2020 Workshop*.
- [W.18] Liu, R., Sarkar, A., **Solovey, E.T.**, Tschitschek, S. (2019). Evaluating Rule-based Programming and Reinforcement Learning for Personalising an Intelligent System. In *Proc. of the 2019 on IUI Workshop on Explainable Smart Systems*.
- [W.17] Friedman, L., Liu, R., Walker, E., **Solovey, E.T.** (2018). Integrating Non-Invasive Neuroimaging and Computer Log Data to Improve Understanding of Cognitive Processes. In *Proceedings of ACM International Conference on Multimodal Interaction Workshop on Modeling Cognitive Processes from Multimodal Data*, ACM Press.
- [W.16] Putze, F., Hild, J., Kasneci, E., Sano, A., **Solovey, E. T.**, Schultz, T. (2018). Modeling Cognitive Processes from Multimodal Data (Workshop Summary). In *Proceedings of ACM International Conference on Multimodal Interaction*, ACM Press.
- [W.15] Girouard, A., Jacob, R.J.K., Shaer, O., **Solovey, E. T.**, Poor, M. (2018). Reflecting on the

Impact of HCI Frameworks, *Proc. ACM CHI 2018 Workshop on Rethinking Interaction*, ACM Press.

- [W.14] Moradinezhad, R., **Solovey, E.T.** (2018) Studying the Effects of Interacting with Virtual Agents in Amplifying Human Senses. In *Proceedings of ACM CHI 2017 Workshop on Amplification and Augmentation of Human Perception*.
- [W.13] McDonald, D. Q., Greenstadt, R., Kaimal, G., **Solovey, E.T.**. Mental Health Markers in Language and Brain Data: Potential Diagnostic Use and Privacy Concerns. In *Proc. of ACM CHI 2017 Symposium on Computing and Mental Health*. 2017.
- [W.12] Liu, R., Marcu, G., **Solovey, E.T.** Mindful Shopping: A Compulsive Buying Disorder Management Tool. In *Proceedings of ACM CHI 2017 Workshop on Interactive Systems in Healthcare (WISH 2017)*.
- [W.11] McDonald, D.Q., **Solovey, E.T.** AgileFood: Facilitating Adaptive Food Donation to Address Hunger & Reduce Waste. In *Proceedings of ACM CHI 2017 Workshop on Designing Sustainable Food Systems*.
- [W.10] **Solovey, E.T.**, Liu, R., Moradinezhad, R.. Advanced Interaction Research in Autonomous Vehicles. *Proc CHI 2016 Workshop on HCI and Autonomous Vehicles: Contextual Experience Informs Design*. 2016.
- [W.9] **Solovey, E.T.**, Afergan, D, Venkat, A., Belyusar, D., Mehler, B., Reimer, B. Enabling Adaptive Autonomy: Brain & Body Sensing for Adaptive Vehicles. *Proc. CHI 2015 Workshop on Autonomous Driving UX*. (2015).
- [W.8] Reinecke, K., Flatla, D., **Solovey, E.T.**, Gutwin, C., Gajos, K., Heer, J. Many People, Many Eyes: Aggregating Influences of Visual Perception on User Interface Design. Workshop at CHI'13. In *ACM Human Factors in Computing Systems (CHI) Extended Abstracts* (2013).
- [W.7]. **Solovey, E.T.** Real-time fNIRS Brain Input for Adaptive Robot Autonomy, *HRI Pioneers Workshop* (2012). [Acceptance Rate: 22%].
- [W.6] **Solovey, E.T.**, Jacob, R.J.K. Meaningful Human-Computer Interaction Using fNIRS Brain Sensing. *Proc. CHI 2011 Workshop on Brain and Body Interfaces: Designing for Meaningful Interaction* (2011).
- [W.5] Girouard, A., **Solovey, E.T.**, Mandryk, R., Tan, D., Nacke, L., Jacob, R.J.K. Brain, Body, and Bytes: Psychophysiological User Interaction. Workshop held at CHI'10. In *ACM Human Factors in Computing Systems (CHI) Extended Abstracts* (2010).
- [W.4] **Solovey, E.T.**, Shaer, O., Girouard, A., Hirshfield, L.M., Horn, M.S., Zigelbaum, J., Jacob, R.J.K. Programming reality within the reality-based interaction framework. *Proc. ACM CHI 2009 Workshop on Programming Reality* (2009).
- [W.3] Hirshfield, L.M., **Solovey, E.T.**, Girouard, A., Jacob, R.J.K., Kebinger, J., Horn, M.S., Shaer, O., Zigelbaum, J., Jacob, R.J.K.. Using Brain Measurement to Evaluate Reality Based Interactions. *Proc. ACM CHI 2009 Workshop on Challenges in Evaluating Usability and User Experience of Reality-Based Interaction* (2009).
- [W.2] Girouard, A., Hirshfield, L.M., **Solovey, E.T.**, Jacob., R.J.K. Using functional Near-Infrared Spectroscopy in HCI: Toward evaluation methods and adaptive interfaces. *Proc. ACM CHI 2008 Workshop on Brain-Computer Interfaces for HCI and Games* (2008).
- [W.1] Horn, M.S., Shaer, O., Girouard, A., Hirshfield, L.M., **Solovey, E.T.**, Zigelbaum, J., Jacob, R.J.K. Putting Tangible User Interfaces in Context: A Unifying Framework for Next Generation HCI. *Proc. ACM CHI 2007 Workshop on Tangible User Interfaces in Context and Theory* (2007).

### Videos (Peer Reviewed)

- [V.1] Bernstein, M., André, P., Luther, K., **Solovey, E.T.**, Poole, E.S., Paul, S.A., Kane, S.K., Grudin, J. (2009). CHIstory. CHI 2009 Video Showcase. In *CHI'09 Extended Abstracts on Human Factors in Computing Systems* (pp. 3493-3494). ACM. **Golden Mouse Award**.

### Other Papers

- [O.13] Dubey, J., Sumaria, M., Oktay, E., Li, Y., Li, Z., Neamtu, R., **Solovey, E.T.** (2019). Towards neuroadaptive technology using time warped distances for similarity exploration of brain data. In *Proc. of Neuroadaptive Technology Conference (NAT 2019)*, Liverpool UK.
- [O.12] Friedman, L., Liu, R., Kim, A., Walker, E., **Solovey, E.T.** (2018). Towards Neuroadaptive

Personal Learning Environments: Using fNIRS to Detect Changes in Attentional State, *Proc. 2nd International Conference on Neuroergonomics*, Frontiers.

- [O.11] Moradinezhad, R., **Solovey, E.T.** (2018). Assessing human reaction to a virtual agent's facial feedback in a simple Q&A setting, *Proc. 2nd International Conference on Neuroergonomics*, Frontiers.
- [O.10] McDonald, D. Q., **Solovey, E.T.** (2017). User Identification from fNIRS Brain Data Using Deep Learning. In *Proc. Neuroadaptive Technology Conference*, Berlin, Germany.
- [O.9] Liu, R., Walker, E., **Solovey, E.T.** (2017). Toward Neuroadaptive Personal Learning Environments. In *Proc. Neuroadaptive Technology Conference*, Berlin, Germany.
- [O.8] Afergan, D., **Solovey, E.T.**, Peck, E.M., Jenkins, A.J., Chang, R., Jacob, R.J.K. (2013). Dynamic Difficulty Using Brain Metrics of Workload for UAV Operators, Student Research Conference. Human Factors and Ergonomics Society New England Chapter, Cambridge, MA.
- [O.7] Teller, S., Horn, B.K., Finman, R., Wu, B., **Solovey, E.T.**, Wang, B., Karraker, J. (2012). Divert and Alert: Mitigating and Warning of Traffic Threats to Police Stopped Along the Roadside, *National Institute of Justice Conference*. Arlington, VA.
- [O.6] Peck, E., & **Solovey, E.T.** Neuroscience and computing. (2011). *ACM XRDS: Crossroads Magazine*, 18(1), 5-5.
- [O.5] Peck, E., & **Solovey, E. T.** (2011) The sensorium. *ACM XRDS: Crossroads Magazine* 18(1), 14-17.
- [O.4] Peck, E., Chauncey, K., Girouard, A., Gulotta, R., Lalooses, F., **Solovey, E.T.**, Weaver, D., & Jacob, R.J.K. (2010). From Brains to Bytes. *ACM XRDS: Crossroads*, 16(4), 42-47.
- [O.3] **Solovey, E.T.** (2008). Using your brain for human-computer interaction, Grace Hopper Celebration of Women in Computing. Poster Session.
- [O.2] Girouard, A., **Solovey, E.T.**, Hirshfield, L.M., Chauncey, K., Sassaroli, A., Fantini, S., & Jacob, R.J.K. (2008). Distinguishing Difficulty Levels with Non-invasive Brain Activity Measurements, Technical Report 2008-3, Department of Computer Science, Tufts University, Medford, Mass.
- [O.1] Jacob, R.J.K., Girouard, A., Hirshfield, L.M., Horn, M., Shaer, O., **Solovey, E.T.**, & Zigelbaum, J. (2007). What Is the Next Generation of Human-Computer Interaction? *Interactions*, 14(3), 53-58.

## AWARDS AND RECOGNITIONS

- 
- **Special Recognition for Reviewing, ACM CHI Conference** 2017
  - **Special Recognition for Reviewing, ACM UIST Conference** 2016
  - **Best Paper Award Honorable Mention, ACM Conference on Human Factors in Computing Systems** [Top 5% of submitted papers]. "Classifying Driver Workload Using Physiological and Driving Performance Data: Two Field Studies." [C.16] 2014
  - **Best Paper Award Honorable Mention, ACM Conference on Human Factors in Computing Systems** [Top 5% of submitted papers]. "Dynamic Difficulty Using Brain Metrics of Workload." [C.15]. 2014
  - **Special Recognition for Reviewing, ACM Conference on Designing Interactive Systems (DIS)** 2014
  - **Best Paper Award Honorable Mention, ACM Conference on Human Factors in Computing Systems** [Top 5% of submitted papers]. "Brainput: Enhancing Interactive Systems with Streaming fNIRS Brain Input." [C.12]. 2012
  - **IEEE/ACM Human-Robot Interaction Pioneer** [Acceptance Rate: 22%]. "Real-time fNIRS Brain Input for Adaptive Robot Autonomy." [W.7]. 2012
  - **Best Poster Award at 2011 IEEE Conference on Information Visualization.** "Near to the brain: Functional near-infrared spectroscopy as a lightweight brain imaging technique for visualization." [P.6]. 2011
  - **Golden Mouse Award, ACM CHI Video Showcase.** "CHIstory." [V.1]. 2009

## GRANTS

- 
- **Snap Creative Challenge Award.** Snap, Inc. Role: PI. Co-Investigators: Ali Shokoufandeh

---

(Drexel), Genevieve Dion (Drexel), Shruti Mahajan (WPI), Denisa Qori McDonald (Drexel), Richard Vallett (Drexel).

- **IIS-1901026 CHS: Medium: Improving Information Accessibility with Sign Language First Technology.** National Science Foundation. Role: PI. Co-Investigator: Jeanne Reis (ASL Education Center). 10/1/2019-9/30/2022. (Total Award: \$1,016,590).
- **1835307 NCS-FO: Integrating Non-Invasive Neuroimaging and Educational Data Mining to Improve Understanding of Robust Learning Processes.** National Science Foundation. Role: PI. 9/1/2018-8/31/2021. Co-Investigators: Erin Walker (Pittsburgh), Catherine Arrington (Lehigh). (Total Award: \$1,031,676, WPI: \$680,167).
- **Closed-Loop BCI Using Adaptive Kinetic Architectural Design to Regulate Human Emotional States.** WPI TRIAD. Role: Co-PI. PI: Ali Yousefi. Co-I: Mohamad Farzinmoghdam (Total Award: \$60,000).
- **CNS-1711773 Research Experience for Teachers Site for Machine Learning to Enhance Human-Centered Computing.** National Science Foundation. Role: Co-PI. PI: Jeffrey Popyack (Drexel). 7/1/2017-6/30/2020. \$599,979.
- **Towards Biometric Input for Multi-Agent Adaptive Human-Robot Collaboration.** Joint WPI-UMass Lowell Seed Funding. Role: PI. Co-Investigators: Pei-Chun Kao (UMass-Lowell), Yanhua Li (WPI), Rodica Neamtu (WPI), Adam Norton (UMass-Lowell), Yi-Ning Wu (UMass-Lowell), Holly Yanco (UMass-Lowell). 6/1/2019- 5/31/2020. (Total Award: \$20,000, WPI: \$10,000).
- **Computing Innovation Fellowship,** Computing Research Association (CRA) & National Science Foundation (NSF). \$140,000 over 2 years. Supported my postdoctoral fellowship at MIT.
- **Early Research in E Term (EREE) program.** Supports undergraduate student research. WPI, Summer 2019, 2020, 2021.
- **DraftKings Undergraduate Fellowship.** Supports undergraduate student research. WPI, Summer 2019.
- **Creating Neuroadaptive Learning Technology Responsibly with Early Stakeholder Input.** Collaborative Research Experience for Undergraduates (CREU) Award. Computing Research Association. \$4,500.
- **Research Co-op Award.** Drexel University Steinbright Center. Role: PI. 2017. \$7,250.
- **Distributed Research Experience for Undergraduates (DREU) Award.** Computing Research Association. Summer, 2017. \$14,000.
- **Distributed Research Experience for Undergraduates (DREU) Award.** Computing Research Association. Summer, 2015. \$7,000.
- **Leveraging Brain Data in Intelligent Tutoring Systems.** Collaborative Research Experience for Undergraduates (CREU) Award. Computing Research Association. \$4,500.

## INVITED TALKS

---

- [T.38] “Decoding Brain and Biosensor Stress Signals for Human-Centered Technology,” Ask Me Anything Panel on Stress, WPI. Virtual. January 14, 2021.
- [T.37] “Integrating Brain Signals and Educational Data Mining to Improve Understanding of Robust Learning Processes,” HCI and the future of work and well-being: A series of conversations. Virtual. November 12, 2020.
- [T.36] “Decoding Brain and Biosensor Signals for Human-Computer Interaction,” Technical talk, Women in Data Science Central Massachusetts Conference. Worcester, MA, USA. March 2, 2020.
- [T.35] “Human-Computer Interaction & Neuroadaptive Technology,” Keynote Talk, Neuroadaptive Technology Conference. Liverpool, UK. July 17, 2019.
- [T.34] “Enhancing Human-Computer Interaction with Real-time Brain Input,” UMass Interdisciplinary Neuroscience Conference. Amherst, MA. May 28, 2019.
- [T.33] “Data-Intensive Neuroscience and Cognitive Science”. NSF Workshop on Integrative Understanding of Neural and Cognitive Systems (NCS). (NSF PI Meeting)
- [T.32] “Careers in Academia,” Scientista Symposium, Boston, MA, March 31, 2019



- [T.31] “Enhancing Human-Computer Interaction with Real-time Brain Input,” WPI Neuroscience Seminar Series, Worcester, MA, January 30, 2019.
- [T.30] “Enhancing Interactive Systems with Real-time Brain Input,” Microsoft Technical Leadership Advisory Board Meeting on Brain-Computer Interfaces, Redmond, WA, August 16, 2018.
- [T.29] “Enhancing Human Collaboration with Artificial Intelligence Systems Through Brain-Computer Interfaces,” Hamlyn Symposium Workshop: Brain-Robot Interactions in Healthcare, London, England, June 23, 2017.
- [T.28] “Enhancing Human-Machine Systems with Real-time Brain Input.” United Technology Research Center, East Hartford, CT. August 11, 2016.
- [T.27] “Enhancing Interactive Systems with Real-time Brain Input.” Workshop on Collaborative Sensing, Learning, and Control in Human-Machine Systems at the American Control Conference, July 5, 2016.
- [T.26] “Exploring Reality-Based Interaction and Brain-Computer Interfaces,” Natural User Interface Central, New York, NY, July 20, 2015.
- [T.25] “Design of Interactive Systems Utilizing Real-Time Brain & Body Input,” Hamlyn Symposium Workshop: Brain-Robot Interactions in Healthcare, London, England, June 23, 2015.
- [T.24] Microsoft Faculty Summit, Redmond, WA, July 14-15, 2014.
- [T.23] “Enhancing Interactive Systems with Real-time Brain & Body Input,” Drexel RETHink Summer Institute in Computer Science for STEM High School and 2-Year College Faculty, College of Computing and Informatics, Drexel University, Philadelphia, PA. July 9, 2014.
- [T.22] “Using Your Brain for Human-Computer Interaction,” Computing Faculty Seminar Series, College of Computing and Informatics, Drexel University, Philadelphia, PA. January 27, 2014.
- [T.21] “Enhancing Interactive Systems with Real-time Brain and Body Input,” Biomed Seminar, Drexel University School of Biomedical Engineering, Science and Health Systems, Philadelphia, PA. January 10, 2014.
- [T.20] “Enhancing Interactive Systems with Real-time Brain Input,” University of Toronto Human Factors Interest Group, Toronto, ON, Canada. December 6, 2013.
- [T.19] Guest Lecture, CS320: Tangible User Interfaces. Wellesley College, Wellesley, MA. October 28, 2013.
- [T.18] Guest Lecture, 6.835 – Intelligent Multimodal User Interfaces, MIT Department of Electrical Engineering and Computer Science (Course 6), Cambridge, MA. April 25, 2013.
- [T.17] “Ph.D. Job Search,” CRA-W Graduate Cohort Workshop, Boston, MA. April 6, 2013.
- [T.16] “Ph.D. Academic Career Paths,” CRA-W Graduate Cohort Workshop, Boston, MA. April 5, 2013.
- [T.15] “Can Computers Read Our Minds? Real-Time Brain Input for Interactive Systems,” Boston Chapter of the Society on Social Implications of Technology, Cambridge, MA. March 4, 2013.
- [T.14] Brown Bag Lunch, Volpe National Transportation Systems Center, Cambridge, MA. December 20, 2012.
- [T.13] “Non-invasively Detecting Cognitive State with fNIRS to Support Human Supervisory Control,” A Day of Autonomy Workshop, hosted by MIT and Lincoln Laboratory, Cambridge, MA. December 17, 2012.
- [T.12] Speaker Series, Personal Robotics Group, MIT Media Laboratory, Cambridge, MA. December, 2012.
- [T.11] “Next Generation Human-Machine Interaction,” Human Machine Interaction Workshop, United Technology Research Center, East Hartford, CT. June 1, 2012.
- [T.10] Boston CHI: Boston Area chapter of ACM’s Special Interest Group on Computer-Human Interaction, Cambridge, MA. March 13, 2012.
- [T.9] Guest Lecture, 6.835 – Intelligent Multimodal User Interfaces, MIT Department of Electrical Engineering and Computer Science (Course 6), Cambridge, MA. April 12, 2011.
- [T.8] “Non-invasively Detecting Cognitive State with fNIRS to Support User Interfaces,” Humans & Automations Laboratory, MIT Department of Aeronautics and Astronautics, Cambridge, MA. July, 2010.

- [T.7] "Tangible Programming at the Museum of Science and Brain-Computer Interfaces," Guest Lecture, CS349 – Tangible User Interfaces, Wellesley College, Wellesley, MA. December 4, 2009.
- [T.6] "Programming with the Brain," When Everything is Programmable Conference, Institute for the Future, Palo Alto, CA. October 2009.
- [T.5] "Using your brain for HCI," Guest Lecture, MAS 672 - New Paradigms for Human-Computer Interaction, MIT Media Lab, Cambridge, MA. March 2009.
- [T.4] "Sensing Auditory Attention," HCI Intern Lunch Talks series, Microsoft Research, Redmond, WA. August, 2008.
- [T.3] "Introduction to SCORM," Education Development Center, Newton, MA. October 9, 2007.
- [T.2] "A window into the brain: new techniques for brain-computer interaction," Graduate Research Symposium Talk, Tufts University, April 13, 2007.
- [T.1] "Finding the Needle in Haystack (HAX), Federated Search using the NCES Framework." E. Treacy, M. Beynon, G. Mezynski. Presented at MIT Lincoln Laboratory. August 8, 2006.

---

## COMMUNITY AND PROFESSIONAL ACTIVITIES

### **Advisory Board**

- Microsoft Technical Leadership Advisory Board on Brain-Computer Interfaces, 2018.

### **Grant Proposal Review Panels**

- NSF CISE Panel Member, 2014, 2016, 2017, 2020
- NASA Panel Member, 2014, 2016
- W.M. Keck Foundation 2014

### **Deputy Editor**

- *International Journal of Human-Computer Studies* (IJHCS) 2019-present

### **Editorial Board**

- *ACM Transactions on Computer-Human Interaction (TOCHI)* 2021-present
- *International Journal of Human-Computer Studies* (IJHCS) 2014-2019
- Invited guest editor for *Frontiers in Bioengineering and Biotechnology* Special Issue on Biomedical Signals for Human-Computer Interaction 2019
- Invited guest editor for *IEEE Computer* Special Issue on Physiological Computing 2015
- Invited guest editor for *ACM XRDS Magazine* Issue on Brain-Computer Interfaces and Neuroscience 2011

### **Program Committee**

- ACM SIGCHI Conference on Human Factors in Computing Systems (CHI) 2013, 2014, 2016, 2017, 2020, 2021.
- Neuroadaptive Technology (NAT) Conference 2017, 2019
- ACM SIGCHI Conference on Tangible, Embedded, Embodied Interaction (TEI) 2012, 2013, 2014, 2015
- Neuroergonomics Conference 2018, 2020
- ACM SIGCHI Conference on Engineering Interactive Computing Systems (EICS), 2017
- ACM Creativity and Cognition 2017
- CHIIR Workshop on Challenges in Bringing Neuroscience to Research in Human-Information Interaction 2017
- Liaison Chair, Symbiotic Interaction Workshop 2017
- Workshops Committee, ACM SIGCHI Conference on Human Factors in Computing Systems (CHI) 2015
- ACM SIGIR Workshop on Neuro-Physiological Research in IR 2015
- International Workshop on Affective Brain Computer Interfaces (ABCI) 2015
- International Workshop on Symbiotic Interaction 2014, 2015
- ACM SIGCHI Conference on Human Factors in Computing Systems Work-in-Progress (CHI WiP) 2012

### **Workshop Organization**

- Modeling Cognitive Processes from Multimodal Data, at ACM International Conference on Multimodal Interfaces (ICMI), October, 2018
- Many People, Many Eyes: Aggregating Influences of Visual Perception on User Interface Design, at ACM Conference on Human Factors in Computing Systems (CHI), April, 2013.
- Brain, Body, and Bytes: Psychophysiological User Interaction, at ACM Conference on Human Factors in Computing Systems (CHI), April 2010.

### **Journal and Conference Reviewer**

- ACM Conference on Human Factors in Computer Systems (CHI) 2007, 2008, 2009, 2010, 2011, 2012, 2015, 2017, 2019
- ACM Symposium on User Interface Software and Technology (UIST) 2009, 2010, 2011, 2012, 2014, 2015, 2016, 2019, 2020
- ACM Conference on Tangible and Embedded Interaction (TEI) 2007, 2008, 2012, 2013, 2014, 2017
- Privacy Enhancing Technologies Symposium (PETs) 2017
- ACM Conference on Designing Interactive Systems (DIS) 2014
- ACM Conference on Computer Supported Cooperative Work (CSCW) 2011, 2018
- ACM Conference on Ubiquitous Computing (UbiComp) 2011, 2012, 2014
- ACM Conference on Engineering Interactive Computing Systems (EICS) 2013
- ACM Conference on Human-Computer Interaction with Mobile Devices and Services (MobileHCI) 2013
- *IEEE Transactions on Affective Computing* 2014
- *IEEE Transactions on Human-Machine Systems* Journal 2013
- *International Journal of Human Computer Studies* 2013
- International Conference on Multimodal Interaction 2013
- *ACM Computing Surveys* 2012
- *Interacting with Computers* Journal 2012
- *ACM Transactions on Computer-Human Interaction* Journal (TOCHI) 2008, 2015, 2017
- Brain-Computer Interfacing Special Session at Conference on Multimodal Interaction (ICMI) 2011
- ACM International Conference on Advances in Computer Entertainment Technology (ACE) 2010
- *Ergonomics* 2011
- *Human Computer Interaction* 2014
- *International Journal of Neural Systems* 2016
- *Multimedia Tools and Applications* Journal 2017
- *Frontiers in Human Neuroscience* 2018

### **University Service**

- WPI Computer Science Faculty Search Committee, 2019-2020
- Neuroscience Master's program grad committee, 2020-present
- WPI Computer Science Graduate Council, 2019-2020
- WPI Neuroscience Task Force, 2018-present
- WPI Neuroscience Faculty Search Committee, 2018-2019
- Drexel University Computer Science Undergraduate Curriculum Committee, 2013-2018
- Drexel University CCI Distinguished Talks Committee, 2017
- Drexel University CCI Women in Computing Initiative, 2017-2018
- Drexel University CCI Budget & Strategic Planning Committee, 2015-2016
- Drexel University CCI Ad-hoc Curriculum Committee on Human-Centered Computing, 2015-2016.

- Faculty Advisor, NSF-Sponsored Research Experiences for Teachers in Engineering and Computer Science Site for Big Data, Machine Learning and CS Principles, Summer 2015
- Faculty Mentor, Drexel Students Tackling Advanced Research (STAR) Scholar Program, 2014, 2015, 2016.
- Undergraduate Research Poster Evaluator, Drexel STAR Scholar Summer Showcase, 2016
- Presidential Council on Family and Work, MIT, 2012-2013
- Graduate Leader, NSF-sponsored Computer Science, Engineering, and Math Scholar Program (CSEMS), Tufts University, 2005-2009

**Student Volunteer**

- Conference on Human Factors in Computer Systems (CHI) 2006, 2007, 2009

**Professional Membership**

- Founding Team, Boston CHI Labs: <http://bostonchilabs.org/>
- ACM Special Interest Group on Computer-Human Interaction (SIGCHI)
- Greater Boston chapter of ACM Special Interest Group on Computer-Human Interaction (SIGCHI)
- Association for Computing Machinery (ACM)
- Institute of Electrical and Electronics Engineers (IEEE)
- Computing Research Association Committee on the Status of Women in Computing Research (CRA-W) Graduate Cohort for Women Program 2006, 2007, 2008
- Tufts Women in Computer Science (WICS)

**Other Activities**

- Technical Leadership Advisory Board on Brain-Computer Interfaces, Microsoft Research, 2018
- Mentor, CRA/CDC Sponsored Distributed Research Experience for Undergraduates, 2015, 2017.
- Mentor, CRA-W Sponsored Collaborative Research Experience for Undergraduates, 2015-2016.
- I<sup>3</sup> Harvard College Innovation Challenge Judge, 2009, 2010, 2011, 2012, 2013
- Harvard University Admissions Interviewer for prospective students, 2003-2013
- Radcliffe Mentor to under-represented computer science undergrads, 2003-2004, 2011-12
- Student Founder of Technology and Entrepreneurship Center at Harvard, 2000

**TEACHING**

---

**Worcester Polytechnic Institute, Worcester, MA**

<b>Human-Computer Interaction (CS3041) - undergraduate</b>	<b>D term, 2021</b>
<b>Brain-Computer Interaction (CS525 Special Topic) - graduate</b>	<b>Spring 2021</b>
<b>Human-Computer Interaction (CS3041) - undergraduate</b>	<b>B term, 2020</b>
<b>Brain-Computer Interaction (CS525 Special Topic) - graduate</b>	<b>Spring 2020</b>
<b>Human-Computer Interaction (CS3041) - undergraduate</b>	<b>D term, 2020</b>
<b>Human-Computer Interaction (CS3041) - undergraduate</b>	<b>B term, 2019</b>
<b>Human-Computer Interaction (CS 546) - graduate</b>	<b>Spring, 2019</b>
<b>Human-Computer Interaction (CS 3041) - undergraduate</b>	<b>D term, 2019</b>

**Undergraduate Major Qualifying Projects (MQPs)**

BrainEx: Visual Exploration and Discovery in Time Series Data. Michael Clements, Andrew Nolan, Jackson Powell. Computer Science. Co-supervised with Rodica Neamtu.	<b>2021</b>
Expanding NIRS Auto ML (NAML) to Better Facilitate Neural Data Analysis. Ellery Buntel, Computer Science. Co-supervised with Rodica	<b>2021</b>

Neamtu.	
Developing and Studying Novel Sign Language Technology. Michelle Santacreu, Interdisciplinary Major in User Experience.	2021
Applying HCI Design Practices to the Design of the BrainEx User-Interface to Facilitate fNIRS Research. Kyra Bresnahan, Margaret Goodwin, Yihan Li, Computer Science. Co-supervised with Rodica Neamtu.	2020
Anomaly Detection in Time Series Brain Data Collected Using Functional Near-Infrared Spectroscopy. Petra Kumi, Computer Science and Math. Co-supervised with Rodica Neamtu and Suzanne Weekes. <b>Provost's Award for Best MQP in Mathematical Sciences.</b>	2020
Implementation of Desktop at Fingertip with mmWave Short Range Radar Technology. Ziheng Li and Aung Khant Min, Computer Science and Electrical and Computer Engineering. Co-supervised with Prof. Kaveh Pahlavan.	2020
NirsAutoML: Building an automated classification platform for fNIRS data, Fareya Ikram, Computer Science. Co-supervised with Rodica Neamtu.	2019
Applying HCI Design Practices to the Design of the BrainEx User-Interface to Facilitate fNIRS Research, Vandana Anand, Computer Science. Co-supervised with Rodica Neamtu.	2019
AR Assisted Cooking, Benjamin Hylak and Mona Elokda, User Experience Engineering (Custom Major) and Electrical and Computer Engineering. Co-supervised with Gillian Smith and Maqsood Mughal.	2019

**Undergraduate Interactive Qualifying Projects (IQPs)**

Ellery Buntel, Co-supervised with Rodica Neamtu.	2021
Yoga and Brain Function, Han Liu, IQP Project Co-Supervisor with Snehalata Kadam, WPI. 2020.	2020

**Independent Study Courses:**

Language Learning and fNIRS, Claire Nicolas (undergraduate)	A term, 2020
Partisanship in Social Media, Christopher Micek (graduate)	Fall, 2019
Application of fNIRS with AX-CPT, Alicia Howell-Munson (undergraduate)	D term, 2019
Brain-Computer Interfaces, Erden Oktay (graduate)	Spring, 2019
Brain-Computer Interfaces, Jayesh Dubey (graduate)	Spring, 2019
Human-Computer Interaction, Neuroimaging and Machine Learning, Alicia Howell-Munson (graduate)	Spring, 2019
Interactive Machine Learning, Ruixue Liu (graduate)	Fall, 2018

**Drexel University, Philadelphia, PA**

<b>Graphical User Interfaces (CS338) - undergraduate</b>	Fall, 2016 Winter, 2016 Winter 2015 Winter 2014
<b>Developing User Interfaces (CS530) - graduate</b>	Spring, 2018 Summer, 2017 Spring, 2016 Fall, 2014
<b>Brain Computer Interaction (CS680) - graduate</b>	Spring, 2014

**Independent Study Courses:**

Statistical and Machine Learning Methods for fNIRS Data Analysis, Leah Friedman (undergraduate)	Fall, 2017
Online Adaptive Learning, AJ St. Aubin (graduate)	Fall, 2017
Adaptive BCI for Intelligent Tutoring System, Ruixue Liu (graduate)	Winter, 2017
Human Interaction with Virtual Agents, Reza Moradinezhad (grad)	Winter, 2017
Human-Centered Development of SCORE, Tenell Rhodes (graduate)	Fall, 2016
fNIRS Data-Driven Interfaces, Aaron Segal (graduate)	Fall, 2016
Adaptive BCI Based on Users' Cognitive State 2, Denisa Qori (graduate)	Fall, 2016
Adaptive BCI Based on Users' Cognitive State, Denisa Qori (graduate)	Summer, 2016
Methods in fNIRS Brain Imaging Analysis, Reza Moradinezhad (graduate)	Summer, 2016
Human-Centered Design & Eval of Lilypad System, Tenell Rhodes (grad)	Spring, 2016
Experimental Design in HCI, Shelby Keating (undergraduate)	Fall, 2016
Brain-Computer Interfaces for Learning, Stevie-Mari Hawkins (graduate)	Winter, 2015
Machine Learning in Brain-Computer Interfaces, Amelia Solon (graduate)	Winter, 2015
Brain-Computer Interfaces in Motor Vehicles, Arudra Venkat (graduate)	Fall, 2014
Privacy Concerns in Brain-Computer Interfaces, Rebekah Overdorf (graduate)	Summer, 2014

**Massachusetts Institute of Technology, Cambridge, MA**

<b>Instructor – Human Values and Technology Seminar</b>	Spring, 2012
---	--------------

**Tufts Department of Computer Science, Medford, MA**

Brain-computer Interface Seminar	Fall, 2009
Graduate Leader – Computer Science, Engineering, Math Scholars	2005-2009
Instructor – Introduction to Digital Information	Summer, 2007
Teaching Assistant – Theory of Computation	Summer, 2007
Teaching Assistant – Human-Computer Interaction	Spring, 2007
Laboratory Instructor – Introduction to Digital Information	Fall, 2006
Teaching Assistant – Human-Computer Interaction	Spring, 2006
Laboratory Instructor – Data Structures	Fall, 2005

**SUPERVISING****Doctoral Research Supervisor:**

- Ruixue Liu, Computer Science, Worcester Polytechnic Institute (current student).
- Alicia Howell-Munson, Bioinformatics & Computational Biology (current student).
- Christopher Micek, Computer Science, Worcester Polytechnic Institute (current student).
- Reza Moradinezhad, Computer Science, Drexel University (current student).
- Denisa Qori, Computer Science, Drexel University (current student).
- Fei Gao, “Modeling Teamwork of Human-Agent Teams,” Engineering Systems Division, February, 2016, Massachusetts Institute of Technology. (co-supervisor)
- Jason Ryan, “Assessment Methods for Collaborative Human-Automation Systems,” Engineering Systems Division, July 2014, Massachusetts Institute of Technology. (co-supervisor)

**Masters Research Supervisor:**

- Alicia Howell-Munson, Bioinformatics and Computational Biology, WPI. August, 2019.
- Kim Jackson, “Development and Evaluation of a Collision Avoidance System for Supervisory Control of a Micro Aerial Vehicle,” Aeronautics and Astronautics, Massachusetts Institute of Technology. June 2012.
- Christopher Berardi, “Investigating the Efficacy of Terrorist Networks Visualizations,” System Design and Management, Massachusetts Institute of Technology. January 2013.
- Pallavi Powale, “Development and Evaluation of an Alerting System for Emergency Responders,” Course VI (Computer Science), Massachusetts Institute of Technology. June 2013.
- Radhika Malik, “Preventative Ergonomic Risk Scheduling,” Course VI (Computer Science), Massachusetts Institute of Technology, June 2013.
- Margarita Parasi, Computer Science, Tufts University. 2010. (co-supervisor)
- Nada Attar, Computer Science, Tufts University. 2009. (co-supervisor).

#### **Undergraduate Research Supervisor:**

- Yihan (Sylvia) Lin, DraftKings Fellowship, WPI, Summer 2019.
- Hannah Borges, DraftKings Fellowship, WPI, Summer 2019.
- Chau Do, Early Research Experience in E Term, WPI, Summer 2019.
- Leah Friedman, Co-op student, April-June 2018. “Creating Neuroadaptive Learning Technology Responsibly with Early Stakeholder Input,” CRA-W/CDC Collaborative Research Experience for Undergraduates (CREU). September, 2018-June, 2019.
- Aria Kim, Williams College, CRA/CDC Distributed Research Experience for Undergraduates, Summer 2017.
- Caitlin McElwee, Rowan University, “Using Machine Learning on fNIRS Data to Detect Changes in Working Memory Load,” CRA/CDC Distributed Research Experience for Undergraduates, Summer 2017.
- Anush Lingamoorthy, Co-op student, April-September 2017.
- Juan Garcia Lopez, Co-op student, April-September 2017.
- Jeremy Solomon, Co-op student, April-September 2017.
- Weidi Tang, Co-op student, April-September, 2017.
- Safa Aman, “Assessing Computer Interfaces to Enhance Creative Thinking,” Students Tackling Advanced Research (STAR) Scholar Program, Computer Science, Drexel College of Computing & Informatics, Summer, 2016.
- Monica Jesteen, “Using fNIRS to Study Brain Processes During the Use of Personalized Learning Environments,” Students Tackling Advanced Research (STAR) Scholar Program, Computer Science, Drexel College of Computing & Informatics, Summer, 2016.
- Enioluwa Segun, “Live Streaming and Analysis of Biosensor Data to Improve Human-Computer Interaction,” Students Tackling Advanced Research (STAR) Scholar Program, Computer Science, Drexel College of Computing & Informatics, Summer, 2016.
- Jianfei Li, Coop student, September, 2015 – March, 2016.
- Calan Farley, “BCIs and Driving,” Coop Project, March-September, 2015.
- Shelby Keating, “Leveraging Brain Data in Intelligent Tutoring Systems,” Coop Project, March-September, 2015. CRA-W/CDC Collaborative Research Experience for Undergraduates (CREU). September, 2015-June, 2016.
- Phoebe Wooldridge, “Improving the fNIRS Dashboard Interface,” CRA/CDC Distributed Research Experience for Undergraduates, Summer 2015.
- Craig Carr, “fNIRS Dashboard,” Students Tackling Advanced Research (STAR) Scholar Program, Computer Science, Drexel College of Computing & Informatics, Summer 2015.
- Patrick Hislop, “fNIRS Dashboard: Launcher project,” Students Tackling Advanced Research (STAR) Scholar Program, Computer Science, Drexel College of Computing & Informatics, Summer, 2015.
- Paritosh Gupta, “Using fNIRS for Brain-Computer Interfaces,” Students Tackling Advanced Research (STAR) Scholar Program, Computer Science, Drexel College of Computing & Informatics, June, 2014-present.

- My Le, “Future HCI Research Project,” Coop Project, March-June, 2015.
- Radhika Malik, “Application of machine learning techniques to identify brain activity patterns in the Brainput system,” Undergraduate Advanced Project, Course VI (Computer Science), 2011-2012, Massachusetts Institute of Technology.
- Pallavi Powale, “Brain-Computer UI Development using fNIRS Technology,” Undergraduate Advanced Project, Course VI (Computer Science), 2011-2012, Massachusetts Institute of Technology.
- Rodolfo Alarcon, “Functional Near-Infrared Spectroscopy Data Analysis Using MATLAB: Improving Human-Computer Interaction,” Course VI (Computer Science), 2011-2012, Massachusetts Institute of Technology
- Carolyn Chang, “Using Variable-Rate Alerting to Counter Boredom in Human Supervisory Control,” Course VI (Computer Science), 2012-2013, Massachusetts Institute of Technology
- Dylan Joss, “Attention Span Fluctuations in Automation Simulations,” Course VI (Computer Science), 2012-2013.
- Hadar Rosenhand, NSF Computing Undergraduates Scholars Program, Spring 2007, Tufts University.
- Kelly Moran, NSF Computing Undergraduates Scholars Program, Spring 2007, Tufts University.

### **Visiting Researchers**

- Kyle Ellis, “Mind Wandering: Using Brain Data to Keep Learners Learning,” NSF-Sponsored Research Experience for Teachers in Machine Learning for Human-Centered Computing, Summer 2018.
- Damian Baraty, “Losing Focus: The Brain Speaks,” NSF-Sponsored Research Experience for Teachers in Machine Learning for Human-Centered Computing, Summer 2018.
- Patricia Rahmlow, “Towards Automatic Detection of Rule Learning Through fNIRS Brain Imaging,” NSF-Sponsored Research Experience for Teachers in Machine Learning for Human-Centered Computing, Summer 2017.
- Gloria Houseman, “Towards Automatic Detection of Rule Learning Through fNIRS Brain Imaging,” NSF-Sponsored Research Experience for Teachers in Machine Learning for Human-Centered Computing, Summer 2017.
- Gloria Houseman, “Direct Brain Assessment for Algebra 2,” NSF-Sponsored Research Experiences for Teachers in Engineering and Computer Science Site for Big Data, Machine Learning and CS Principles, Summer 2015.
- Bruce Karpe, NSF-Sponsored Research Experiences for Teachers in Engineering and Computer Science Site for Big Data, Machine Learning and CS Principles, Summer 2015.

### **Member of Dissertation/Thesis Committee:**

- Jayam Patel, “Improving Human Performance in Multi-Human Multi-Robot Interaction,” Ph.D. Dissertation Proposal Committee, Robotics Engineering, WPI, 2020.
- Ehsan Khosroshahi, Ph.D. Dissertation Defense Committee, Computer Science, Drexel, Summer, 2019.
- Leah Kulp, Ph.D. Proposal Committee, Information Science, Drexel, March, 2019.
- Jayam Patel, “Mixed-Granularity Human-Swarm Interaction,” Ph.D. Qualifier Committee, Robotics Engineering, WPI, 2018.
- Jennifer Engimann, “Interactive Team Learning of Coordinated Behaviors: Toward a Cognitive Model for Square Dancing,” Ph.D. Candidacy Committee, Computer Science, Drexel, 2018.
- Ilkka Kosunen, “Exploring the Dynamics of the Biocybernetic Loop in Physiological Computing,” Ph.D. External Examiner, University of Helsinki, 2017.
- Rebekah Overdorf, “Bridging Distinct Domains in Privacy Related Learning Problems,” Ph.D. Dissertation Committee, Computer Science, Drexel, 2017.
- Anushay Furqan, “Learnability Through Adaptive Discovery Tools in Voice User Interfaces,” M.S. Thesis Committee, Digital Media, Drexel, 2017.
- Ehsan Khosroshahi, Ph.D. Proposal Committee, Computer Science, Spring 2017.
- Chelsea Myers, Ph.D. Qualifying Exam Committee, Digital Media, Drexel, 2017.



- Brett Harte, “The Use of the Animation Principle Exaggeration Within Interactions in VR,” M.S. Thesis Committee, Digital Media, Drexel, 2017.
- Rebekah Overdorf, “Domain Adaptation in Privacy Problems,” Ph.D. Dissertation Proposal Committee, Computer Science, Drexel, January, 2017.
- Alexis Morris, “FRIEND: A Brain-Monitoring Agent Architecture for Adaptive Systems,” Ph.D. Dissertation Committee, Computer Science, University of New Brunswick. External examiner. September 2016.
- Felicia Tucker, “Player Choices In a Visual Novel with Round Character Avatars,” M.S. Thesis Committee, Digital Media, Drexel, expected September 2016.
- Ahmad Pourshoghi, “Application of Machine Learning and Functional Data Analysis in Classification and Clustering of Functional Near Infrared Spectroscopy Signal in Response to Noxious Stimuli” Ph.D. Dissertation Committee, Biomedical Engineering, Drexel, May 2014.
- Cathy Lu, “A Biofeedback-based Approach to Horror Game Design,” M.S. Thesis Committee, Digital Media, Drexel, December 2014.
- Ehsan Khosroshahi, “Representation and Simulation of Brain and Body in Cognitive Architectures,” Ph.D. Candidacy Committee, Computer Science, Drexel, November 2014.
- Rebekah Overdorf, “Domain Adaptation and Stylometry,” Computer Science, Ph.D. Candidacy Committee, Drexel, December 2014.
- Robert Lass, “Distributed Constraint Reasoning for the Real World,” Computer Science, Ph.D. Proposal Committee, Drexel, October 2014.
- Ahmad Pourshoghi, “Using Machine Learning Methods to classify functional Near Infrared Spectroscopy (fNIRS) Signal in Response to Painful Stimuli” Ph.D. Proposal Committee, Biomedical Engineering, Drexel, May 2014.

## PRESS

---

- *Worcester Telegram* (January 10, 2020). “WPI researcher gets \$1M grant to develop technology for deaf users,” <https://www.telegram.com/news/20200110/wpi-researcher-gets-1m-grant-to-develop-technology-for-deaf-users>.
- *WPI News* (January 8, 2020). “WPI to Help Develop Novel Sign Language Technology,” <https://www.wpi.edu/news/wpi-help-develop-novel-sign-language-technology>
- *WBZ 4 CBS News* (April 2, 2019). “WPI ‘Thinking Cap’ Study Could Improve Online Learning,” <https://boston.cbslocal.com/2019/04/02/erin-solovey-wpi-thinking-cap-study/>
- *NSF Science Now: Episode 62*. <https://science360.gov/obj/video/30dbb192-d5db-4588-a7b4-c94a07ef5686/nsf-science-now-episode-62>
- *Worcester News Tonight* (Jan 31, 2019). “WPI Thinking Cap,” <https://www.youtube.com/watch?v=4npohW82vVA&feature=youtu.be&t=666>
- *WPI News* (Jan 29, 2019). “A New Kind of Thinking Cap: WPI Researchers Are Using Brain Imaging to Improve Personalized Learning Environments,” <https://www.wpi.edu/news/new-kind-thinking-cap-wpi-researchers-are-using-brain-imaging-improve-personalized-learning>
- *Drexel College of Computing & Informatics News*. (August 8, 2017). “Computer Science Research with Social Impact Featured at RETHink Showcase,” <http://drexel.edu/cci/news-events/news/2017/August/computer-science-research-with-social-impact-featured-at-rethink-showcase/>
- *EXEL Magazine*. (September, 2016). “Driven to Distraction,” <http://exelmagazine.org/article/driven-to-distraction/>
- *New Scientist*. (February 9, 2016). “Mind-reading tech helps beginners quickly learn to play Bach,” <https://www.newscientist.com/article/2076899-mind-reading-tech-helps-beginners-quickly-learn-to-play-bach/>
- *New Scientist*. (December 17, 2013). “Mind-reading light helps you stay in the zone,” <http://www.newscientist.com/article/mg22029484.500-mindreading-light-helps-you-stay-in-the-zone.html>
- *New Scientist*. (February 20, 2013). “Brain scanning headset monitors your mental workload,” <http://www.newscientist.com/article/mg21729056.500-brainscanning-headset-monitors-your-mental-workload.html?full=true>

- *Discovery News*. (May 21, 2012). "Fix Stress Overload with a 'Brainput' System," <http://news.discovery.com/tech/brainput-120521.html>
- *Smartplanet Smart Takes*. (May 20, 2012). "Wearable brain sensor helps workers multitask," <http://www.smartplanet.com/blog/smart-takes/wearable-brain-sensor-helps-workers-multitask/26566>
- *IEEE Spectrum Tech Talk* (May 17, 2012). "Wearable Brain Scanner Tells Your Computer When You're Overwhelmed," <http://spectrum.ieee.org/tech-talk/biomedical/imaging/wearable-brain-scanner-tells-your-computer-when-youre-overwhelmed>
- *Wired UK*. (May 15, 2012). "MIT's 'Brainput' offloads human multitasking to a computer," <http://www.wired.co.uk/news/archive/2012-05/15/brainput>
- *Engadget*. (May 15, 2012). "MIT's Brainput reads your mind to make multitasking easier," <http://www.engadget.com/2012/05/15/mits-brainput-reads-your-mind-to-make-multi-tasking-easier/>
- *Technology Review*. (May 14, 2012). "A Computer Interface that Takes a Load Off Your Mind," <http://www.technologyreview.com/news/427920/a-computer-interface-that-takes-a-load-off-your/>
- *Extremetech*. (May 14, 2012). "MIT's Brainput boosts your brain power by offloading multitasking to a computer," <http://www.extremetech.com/extreme/129279-mits-brainput-boosts-your-brain-power-by-offloading-multitasking-to-a-computer>
- MIT CSAIL. (Apr. 2, 2012). "CSAIL scientist, Mass State Police to tackle problem of roadside collisions between drivers and police vehicles," <http://www.csail.mit.edu/node/1724>
- Tufts Journal. (Feb. 3, 2008). "Mind-reading Computers: It may sound like sci-fi, but one day a computer may sense when you're stressed and tell you to take a break," <http://tuftsjournal.tufts.edu/archive/2008/february/features/computer.shtml>
- Computerworld. (Feb. 1, 2008). "Give your computer the finger: Touch-screen tech comes of age," [http://computerworld.com/action/article.do?command=viewArticleBasic&taxonomyName=hardware&articleId=9058841&taxonomyId=12&intsrc=kc\\_feat](http://computerworld.com/action/article.do?command=viewArticleBasic&taxonomyName=hardware&articleId=9058841&taxonomyId=12&intsrc=kc_feat)
- Tufts Daily (Oct. 18, 2007). "Tufts researchers delve into the human brain with cutting-edge 'light imaging' technology," <http://media.www.tuftsdaily.com/media/storage/paper856/news/2007/10/18/Features/Tufts.Researchers.Delve.Into.The.Human.Brain.With.CuttingEdge.light.Imaging.Tech-3041180.shtml>
- EE Times (Oct. 5, 2007). "Mind controls computer," <http://www.eetimes.com/news/latest/showArticle.jhtml;jsessionid=E1PLXMX4NMTT2QSNDL SCKHA?articleID=202201609>
- Science Daily, (Oct. 1, 2007). "Technology Could Enable Computers To 'Read The Minds' Of Users," <http://www.sciencedaily.com/releases/2007/10/071001125649.htm>
- Diversity/Careers in Engineering & Information Technology, Vol. XVI, No. 3, pp. 83-84 (Summer/Fall 2007). "Tufts University attracts women to computer science," [http://www.diversitycareers.com/articles/college/07-sumfall/saluting\\_tufts.htm](http://www.diversitycareers.com/articles/college/07-sumfall/saluting_tufts.htm)
- Tufts Engineering eNews, (May 2007). "Technology May Bridge Emotion Gap between Humans and Computers," [http://engineering.tufts.edu/Engineering-Page-eng2w\\_1181737584903.html](http://engineering.tufts.edu/Engineering-Page-eng2w_1181737584903.html)
- Tufts.edu, (April 23, 2007). "A Smooth Transition," [http://www.tufts.edu/home/feature/?p=women\\_engineering&p3=3](http://www.tufts.edu/home/feature/?p=women_engineering&p3=3)