Oliver Saunders Wilder*, Ph.D.

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Education

Massachusetts Institute of Technology Cambridge, MA

MIT Media Lab & Simons Center for the Social Brain at MIT

Simons Postdoctoral Fellow — 2017 to 2019

Continuing my doctoral work leveraging innovative technology for psychological and neuroscience research, I am working to further develop, validate, and disseminate tools and methods to enable the use of interpersonal physiological synchrony measures by researchers conducting both basic and translational research into social and affective functioning in ASD.

Northeastern University Boston, MA

Bouvé College of Health Science & Khoury College of Computer and Information Science

Ph.D. in Personal Health Informatics — 2012 to 2017

Transdisciplinary Ph.D. program joint between Bouvé College of Health Science and Khoury College of Computer and Information Science combining, behavioral science, computer science, and design

Research interests: Social & Affective Neuroscience, Advanced Statistical Methods, Computational Behavioral Science, Psychophysiology, Autism
Dissertation: Quantitative Assessment of Socio-Affective Dynamics in Autism Using Interpersonal Physiology
Dissertation Committee: Dr. Matthew S. Goodwin, Dr. Karen Quigley, Dr. Rosalind Picard

Harvard University Cambridge, MA

Bachelor of Liberal Arts, in Extension Studies (cum laude) — June, 2009

    Concentration in Psychology
    Citation (minor) in Engineering
    Member of Phi Beta Honor Society

Special Student, Harvard Graduate School of Arts and Sciences — 2007 to 2009

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* Formerly Oliver Wilder-Smith

Employment

Lead Technologist Tools of the Mind, Inc. — 2019 to Present

Oversee design, development, and deployment of a suite of iOS and Web-based software for early childhood education, with a focus on supporting child and teacher development. Analyze behavioral and assessment data to support on-going research and development and academic research into self-regulation and literacy devleopment in young children. Product lines:

- The **PowerTools for Reading** iPad app designed to support children's literacy development, with a proprietary intelligent scaffolding system that supports children in developing core literacy skills, and an online dashboard for teachers and literacy specialists with classroom and child level data and customized analytics to help teachers improve instruction, track children's progress, and provide targeted individual scaffolding to each student.
- **iScaffold for iPad & Web**, an interactive multimedia application for teachers and educational coaches for the Tools of the Mind ® curriculum to access curriculum content. For more information see iScaffold.net

Product Manager Affectiva, Inc. — 2009 to 2012

- Hired by Affectiva's founders as the first employee to oversee all aspects of taking the iCalm wearable physiological sensing technology I co-developed as an undergraduate from a university prototype to a high-quality ISO certified commercial product sold to hundreds of university researchers and Fortune 500 companies around the world.
- Redesigned and re-engineered the device to make it robust, affordable to manufacture, comfortable, easy-to-use, and oversaw the design and deployment of software tools to simplify management, viewing, and analysis of physiology data recorded by the newly branded Q Sensor.
- As the company grew, I assumed the role of Product Manager for the entire physiological sensing product line, overseeing a five person engineering team that included electrical engineers, software engineers, and digital signal processing scientists.
- In addition to overseeing the Q Sensor line, I contributed to both frontend and backend design and development for Affdex, Affectiva's web-based facial expression analysis software.
- Inventor on 11 US and international patents for technology developed during my time at Affectiva

Research Assistant Affective Computing Group, MIT Media Lab — 2008 to 2009

- Part of a small engineering team designing and implementing wearable wireless physiological sensing system (iCalm) for use in psychological research on emotion.
- Duties included circuit design, circuit board layout, design for manufacture, and testing and assembly of physiological sensing units.
- This work led to a journal article on which I am a co-author, a utility patent on which I am an inventor, and a an MIT spin-out company of which I was a founding employee.

Research Assistant Gilbert Lab, Psychology Department Harvard University — 2007 to 2008

Assisted with research on affective forecasting and decision-making under the supervision of Professor Daniel Gilbert. Responsibilities included conducting experiments, entering and analyzing data using SPSS.

Assistant Counselor Academy of Physical and Social Development — 2004 to 2009

Worked with children grades 1-6 with special needs (including children on the autism spectrum, and children diagnosed with ADHD) leading cooperative games designed to support social and emotional development. One year of internship, then hired as a paid employee in 2005. For more information about this organization see http://www.academymetrowest.com/.

Awards

Simons Postdoctoral Fellowship — September, 2017

Simons Center for the Social Brain, MIT

Dean's List Academic Achievement Award — June, 2009

Harvard University

Phi Beta Honor Society — June, 2009

Harvard University

Certificate of Distinction in Teaching — April, 2008

Derek Bok Center for Teaching and Learning, Harvard University

Derek Bok Public Service Prize — June, 2006

Harvard University

Dean's List — 2003 to 2009

Harvard University

Patents

Washable, Wearable, Biosensor — US Pat. App. No. 12/386,348 Issued March 20, 2012

Biosensor With Pressure Compensation — US Pat. App. No. 12/905,636, Issued November, 13 2012

Method for Biosensor Usage With Pressure Compensation — US Pat. App. No. 13/674,325, Issued March, 12 2013

Analysis of physiology based on electrodermal activity — US Pat. App. No. 13/624,894, Filed September 22, 2012

Mental State Analysis Using Web Services — US Pat. App. No. 61/352,166, Filed June 7, 2010

Biosensor Module with Automatic Power On Capability — US Pat. App. No. 12/840,074, Filed July 20, 2010

Biosensor Module with Leadless Contacts — US Pat. App. No. 12/905,560, Filed October, 15 2010

Sharing Affect Data Across a Social Network — US Pat. App. No. 61/414,451, Filed November 17, 2010

Using Affect Within a Gaming Context — US Pat. App. No. 1336648, Filed February 12, 2012

Visualization of Affect Responses to Videos — US Pat. App. No. 61/447,089 Filed February 27, 2011

Video Recommendation Based On Affect — US Pat. App. No. 61/447,464 Filed February 28, 2011

Clinical Analysis Using Electrodermal Activity — US Pat. App. No. 13/624,898 Filed September 22, 2012

Publications

Journal Publications

Kleckner, I. R., Jones, R. M., **Wilder-Smith, O.**, Wormwood, J. B., Akcakaya, M., Quigley, K. S., ... & Goodwin, M. S. (2018). Simple, transparent, and flexible automated quality assessment procedures for ambulatory electrodermal activity data. IEEE Transactions on Biomedical Engineering, 65(7), 1460-1467.

Palumbo, R. V., Marraccini, M. E., Weyandt, L. L., **Wilder-Smith, O.**, McGee, H. A., Liu, S., & Goodwin, M. S. (2017). Interpersonal autonomic physiology: A systematic review of the literature. Personality and Social Psychology Review, 21(2), 99-141.

Chaspari, T., Goodwin, M., **Wilder-Smith, O.**, Gulsrud, A., Mucchetti, C., Kasari, C., & Narayanan, S. (2014). A non-homogeneous Poisson process model of skin conductance responses integrated with observed regulatory behaviors for Autism intervention. In Acoustics, Speech and Signal Processing (ICASSP), 2014 IEEE International Conference on (pp. 1611-1615). IEEE.

Fletcher R.R., Dobson K., Goodwin M.S., Eydgahi H., **Wilder-Smith O.**, Fernholz D., Kuboyama Y., Hedman E., Poh M.-Z., Picard R.W. (2010) iCalm: wearable sensor and network architecture for wirelessly communicating and logging autonomic activity — IEEE Transactions on Information Technology in Biomedicine 14(2): 215-223

Conference Presentations

O. Saunders Wilder, J. C. Sullivan, K. Johnson, R. V. Palumbo, C. Cumpanasiou, R. Picard and M. S. Goodwin, Dyadic Physiological Interdependence And Social Reciprocity In ASD International Meeting For Autism Research, Rotterdam, Netherlands. May, 2018

O. Saunders Wilder, J. C. Sullivan, R. V. Palumbo, & M. S. Goodwin, Physiological Synchrony and Interpersonal Processes: How Shared Physiology Shapes Interaction. Society for Personality and Social Psychology Annual Convention 2018, Atlanta, GA. March, 2018

O. Wilder-Smith, J. C. Sullivan, R. V. Palumbo, C. DiStefano, A. Gulsrud, C. K. McCracken, C. Kasari and M.S. Goodwin, Quantitative Assessment of Socio-Affective Dynamics in Autism Using Interpersonal Physiology International Meeting For Autism Research, Baltimore, MD. May, 2016

O. Wilder-Smith, R. V. Palumbo, J. C. Sullivan & M. S. Goodwin, Quantitative Assessment Of Interpersonal Autonomic Synchrony Using Dynamical Systems Models Society for Affective Science Conference 2016, Chicago, IL. March, 2016

O. Wilder-Smith & M.S. Goodwin, EDA Toolkit: A browser-based tool for viewing multimodal physiological and behavioral data 4th Annual Meeting of NSF Expeditions in Computer Science: Computational Behavioral Science. October, 2013

Hedman, E., **Wilder-Smith, O.**, Goodwin, M.S., Poh, M.-Z., Fletcher, R., Picard, R. iCalm: Measuring electrodermal activity in almost any setting — 3rd International Conference on Affective Computing and Intelligent Interaction, 2009 pp.1-2, 10-12

Invited Presentations

O. Saunders Wilder, <u>Social Emotional Differences in ASD</u>, Guest Lecture for *Autism Theory & Technology*, MIT. March 2018

O. Saunders Wilder, <u>Affective Computing in the Classroom: Theory, Methods, and Technology,</u> Measuring and Assessing Skills Conference, Center for the Economics of Human Development, University of Chicago, February 2018

O. Saunders Wilder, <u>Measuring Emotion and Its Physiology In Social Interaction</u>, Guest Lecture for *Affective Computing* , MIT. November 2017

Wilder-Smith, O. (March, 2013) <u>Physiological Measurement In Empirical Research: Theory, Technology, & Best Practices</u> Guest lecture for *Empirical Research Methods*, Northeastern University.

Wilder-Smith, O. (April, 2011) <u>An Introduction to Measuring Emotion: Theory, Technology, and Best Practices.</u> Guest lecture for *Measuring the User Experience*, Bentley University.

Teaching

Co-Instructor, Affective Computing MIT Media Lab — Fall, 2018

Co-taught <u>MAS.630 Affective Computing</u> with Professor Rosalind Picard. MAS.630 Affective Computing instructs students on how to develop technologies that help people measure and communicate emotion, that respectfully read and that intelligently respond to emotion, and have internal mechanisms inspired by the useful roles emotions play. Topics include the interaction of emotion with cognition and perception; the communication of human emotion via face, voice, physiology, and behavior; construction of computers, agents, and robots having skills of emotional intelligence; the role of emotion in decision-making and learning; and affective technologies for education, autism, health, and market research applications.

Teaching Assistant Harvard Extension School — 2004 to Present

Teaching Assistant for E-123a Analog Electronic Design, ENSC E-123 Digital Electronic Design courses. Responsibilities include leading review sections, assisting in weekly lab sessions, responding to student questions, and grading and commenting on weekly homework and exams.

Teaching Assistant Harvard College — 2006 to 2009

Teaching Assistant for P-123 Analog and Digital Electronic Circuit Design course. Responsibilities included leading review sections, assisting in weekly lab sessions, responding to student questions, and grading and commenting on weekly homework and exams.

Teaching Assistant Harvard Summer School — 2006 to 2009

Teaching Assistant for S-123 Analog and Digital Electronic Circuit Design Course. Responsibilities included leading review sections, running weekly lab sessions, responding to student questions, and grading and commenting on weekly homework and exams.

Ad-hoc Reviewing

- Behavior Research Methods
- IEEE Transactions on Affective Computing
- Journal of Autism and Developmental Disorders
- Autism Research
- Focus on Autism and Other Developmental Disabilities
- Autism: International Journal of Research and Practice
- International Journal of Child-Computer Interaction
- Interacting with Computers
- ACM Computer Human Interaction (CHI)
- Journal on Multimodal User Interfaces

Software/Technical Skills

Python	(SciPy, NumPy, Scikit)
R	(lme4, ggplot2, dplyr)
Objective C, Swift	(iPhone, iPad, & Apple Watch)
Web Development	(LAMP, Flask, JQuery, D3, HTML5, CSS)
C, C++, C for Embedded Targets (AVR, ARM7)	(LPC, ATMEL, RasperryPi)
Assembler (Intel)	(8051)
Java / Android Development	(Both tablet & phone development, phone-based sensing)
Analog/Digital electronics	(Bluetooth, WiFi, filtering, mixed signal, PCB layout and design)
Fabrication	(3D Printing, Laser Cutting, Fine Woodworking)