

Dan Adler

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EDUCATION

Doctor of Philosophy

2019-Present

Cornell University

Information Science. Thesis Committee: Tanzeem Choudhury, PhD (Advisor and Chair), Deborah Estrin, PhD, Fei Wang, PhD.

2021 National Science Foundation Graduate Research Fellow

2022-23 Digital Life Initiative Doctoral Fellow

Master of Science

2022

Cornell University

Information Science. Awarded at admission to PhD Candidacy.

Bachelor of Science, GPA 3.91/4.00

2016

The Johns Hopkins University

Double Major in Biomedical Engineering (BME) and Applied Mathematics and Statistics (AMS), minor in Computer Science (CS), specializations in computational biology and optimization.

ONGOING RESEARCH

Psychometric Machine Learning

In collaboration with Tanzeem Choudhury, PhD, Deborah Estrin, PhD (Cornell Tech), Fei Wang, PhD (Cornell University), David Mohr, PhD (Northwestern University)

Over the past decade, researchers have identified links between digital data types (eg, smart-phone sensing, social media) and mental health symptoms. Yet, research demonstrates that current modeling approaches do not make equitable predictions across individuals, are unreliable over time, and are not adaptable to the diverse data types that may exist throughout a population. In this work, we define “Psychometric Machine Learning” as modeling approaches that integrate the psychometric concepts of reliability and validity into their conceptualization and assessment. We thus aim to create modeling approaches to identify more reliable and valid digital biomarkers of mental health.

Using Digital Behavioral Biomarkers in Online Therapy

In collaboration with Tanzeem Choudhury, PhD, Deborah Estrin, PhD (Cornell Tech), Cristian Danescu-Niculescu-Mizil, PhD (Cornell University), David Mohr, PhD (Northwestern University), Fei Wang, PhD (Weill Cornell Medicine)

Collaborating with an online therapy provider to investigate how digital behavioral biomarkers can be integrated into online therapy to improve mental health and engagement outcomes.

Understanding Mental Health Clinicians' Perceptions of Using Patient Generated Health Data

In collaboration with Deborah Estrin, PhD (Cornell Tech), Jodie Nghiem, BSc/BA, J.P. Pollak, PhD (Will Cornell Medicine)

Mental health clinicians often rely on infrequent snapshots of patient-reported symptoms for diagnosis and management of psychiatric conditions. Sources of patient-generated health data (PGHD) can provide these clinicians with additional real-time data between appointments to use in clinical decision making. This study is exploring mental health clinicians' preferences for integrating PGHD into their clinical decision making and workflow.

PUBLICATIONS

Daniel A. Adler*, Emily Tseng*, Khatiya C. Moon, John Q. Young, John M. Kane, Emanuel Moss, David C. Mohr, and Tanzeem Choudhury. 2022. Burnout and the Quantified Workplace: Tensions around Personal Sensing Interventions for Stress in Resident Physicians. *Proc ACM Hum-Comput Interact.* 6, CSCW2: 430:1-430:48. (in press).

** Indicates equal contribution, listed alphabetically in order by last name.*

Daniel A. Adler, Fei Wang, David C. Mohr, and Tanzeem Choudhury. 2022. Machine learning for passive mental health symptom prediction: Generalization across different longitudinal mobile sensing studies. *PLOS ONE* 17, 4: e0266516. <https://doi.org/10.1371/journal.pone.0266516>

Lisa Militello, Michael Sobolev, Fabian Okeke, **Daniel A. Adler**, and Inbal Nahum-Shani. 2022. Digital Prompts to Increase Engagement With the Headspace App and for Stress Regulation Among Parents: Feasibility Study. *JMIR Formative Research* 6, 3: e30606. <https://doi.org/10.2196/30606>

Daniel A. Adler, Fei Wang, David C. Mohr, Deborah Estrin, Cecilia Livesey, and Tanzeem Choudhury. 2022. A call for open data to develop mental health digital biomarkers. *BJPsych Open* 8, 2. <https://doi.org/10.1192/bjo.2022.28>

Daniel A. Adler, Vincent W.-S. Tseng, Gengmo Qi, Joseph Scarpa, Srijan Sen, and Tanzeem Choudhury. 2021. Identifying Mobile Sensing Indicators of Stress-Resilience. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies* 5, 2: 51:1-51:32. <https://doi.org/10.1145/3463528>

Daniel A Adler, Dror Ben-Zeev, Vincent W-S Tseng, et al. 2020. Predicting Early Warning Signs of Psychotic Relapse From Passive Sensing Data: An Approach Using Encoder-Decoder Neural Networks. *JMIR mHealth and uHealth* 8, 8: e19962. <https://doi.org/10.2196/19962>

S. K. Kang, S. Ammanuel, **Daniel A. Adler**, and S. D. Kadam. 2020. Rescue of PB-resistant neonatal seizures with single-dose of small-molecule TrkB antagonist show long-term benefits. *Epilepsy Research* 159: 106249. <https://doi.org/10.1016/j.epilepsyres.2019.106249>

S. K. Kang, S. Ammanuel, S. Thodupunuri, **Daniel A. Adler**, M. V. Johnston, and S. D. Kadam. 2018. Sleep dysfunction following neonatal ischemic seizures are differential by neonatal age of insult as determined by qEEG in a mouse model. *Neurobiology of Disease* 116: 1–12.

<https://doi.org/10.1016/j.nbd.2018.04.012>

Simon Ammanuel, Wesley C. Chan, **Daniel A. Adler**, et al. 2015. Heightened Delta Power during Slow-Wave-Sleep in Patients with Rett Syndrome Associated with Poor Sleep Efficiency. PLOS ONE 10, 10: e0138113. <https://doi.org/10.1371/journal.pone.0138113>

Daniel A. Adler, S. Ammanuel, J. Lei, et al. 2014. Circadian cycle-dependent EEG biomarkers of pathogenicity in adult mice following prenatal exposure to in utero inflammation. Neuroscience 275: 305–313. <https://doi.org/10.1016/j.neuroscience.2014.06.022>

INVITED TALKS AND PRESENTATIONS

Are mental health digital biomarkers reliable? Poster presented at the Nature Medicine in a Virtual Age Conference. 5-6 October 2022.

Identifying Mobile Sensing Indicators of Stress-Resilience. Presented at ACM Ubicomp. 14 September 2022.

Predicting Behavioral Changes associated with Stress-Resilience. Presented at ACM Ubicomp. 14 September 2022.

Are mental health digital biomarkers reliable? Invited talk with the Data Science for Mental health special interest group (DS4MH) at The Alan Turing Institute. 21 July 2022.

Machine learning for passive mental health symptom prediction: Generalization across different longitudinal mobile sensing studies. Poster presented at Cornell's Machine Learning in Medicine Symposium. 6 June 2022. **Third place “Best Poster” Award.**

Mobile Sensing Data, Machine Learning, and Mental Health. Invited guest lecture at Cornell Tech's Machine Learning and Health Class. 2 February 2022.

Identifying Mobile Sensing Indicators of Stress-Resilience. Invited guest lecture at Cornell Tech's AI in Health Class. 21 November 2021.

Developing Generative Adversarial Networks to Predict Individual-Level Mental Health Symptoms. Presented at the Cornell Artificial Intelligence Seminar. 25 September 2020.

Predicting Indicators of Resilience Using Wearables and Smartphones. Presented at the Cornell Information Science Seminar. 15 September 2020.

A System for Predicting Relapse in Schizophrenia Spectrum Disorders. Presented at the Precision Behavioral Health Virtual Launch at Cornell Tech. 14 September 2020.

HONORS & AWARDS

Cornell InfoSci Department Service Award, AY 2021-2022

Johns Hopkins University Honors, Spring 2016

Biomedical Engineering Departmental Honors, Spring 2016

Applied Mathematics and Statistics Departmental Honors, Spring 2016

Dean's List, Fall 2012 - Spring 2016

Biomedical Engineering Richard J. Johns Award, Spring 2016

Applied Mathematics and Statistics Mathematical Modeling Award, Spring 2015

TEACHING EXPERIENCE

Cornell Tech INFO 5375 Machine Learning in Health Part-time TA, Spring 2022

Cornell Tech Masters Specialization Project Advisor, Spring 2022, Spring 2021, Fall 2021

Cornell Tech INFO 5610 Precision Behavioral Health TA, Fall 2020

Cornell Tech CS 5304 Data Science in the Wild TA, Spring 2020

Coder Academy Australia Post Tech Academy, Machine Learning Developer and Teacher, 2019

PwC R Bootcamp Developer and Teacher, Spring 2017, Python Bootcamp, Fall 2017, Spring 2018

TEALS, Microsoft Philanthropies Computer Science Teacher, Fall 2017, Spring 2018

Johns Hopkins BME 580.222 Signals, Systems and Controls TA, Spring 2016

Johns Hopkins AMS 550.111 Statistical Analysis 1 TA, Fall 2015

INDUSTRY AND RESEARCH EXPERIENCE

Graduate Student Researcher

2021-Present

Optum Labs, UnitedHealth Group

- Researching novel programs integrating near-continuous digital data streams (eg, wearable, smartphone data) into collaborative care settings for improved mental health risk stratification and treatment.

Educator & Course Developer

2018-2019

Coder Academy

- Developed and taught a two-year technology innovation boot camp for a large organization within Australia
- Created and taught data science courses and workshops to upskill adults on industry-relevant problems

Associate, Advisory Analytics

2016-2018

PricewaterhouseCoopers

- Drove large investments into community health by working with provider systems to analyze their patient populations using public/proprietary datasets, machine learning and simulation

- Worked on the creation of an application in PySpark hosted on a hadoop-environment to perform automated optimization and data mashing using a set of linear programming and k-nearest neighbor based algorithms
- Performed data cleaning and merging for a large pharmaceutical company to better track their product performance
- Investigated the use of an Agent Based Model (ABM) to assess the market potential for a new Pharmacogenomic (PGx) test

Researcher

2013-2014

Kennedy Krieger Neuroscience Department

- Researched the long-term effects of developmental brain injury using mouse models and patient EEGs

Researcher

2013

The Children's Hospital of Philadelphia Center for Autism Research (CAR)

- Analyzed the effects of biological reward on adults and children with and without Autism Spectrum Disorders (ASD) through preparing simulations and studying fMRI's

SERVICE

PhDs at Cornell Tech (PACT) Hiring Committee Officer, 2022

Big Brothers Big Sisters (BBBS) of NYC Big, 2021-Present

Cornell IS Grad. Student Association Admissions Representative, 2020-2021

Tau Beta Pi Maryland Alpha Chapter President, 2015-2016

Johns Hopkins Clinic Scheduling Team Leader, 2014-2016

THREAD Head of Family, 2015-2016

PROFESSIONAL ORGANIZATIONS

Tau Beta Pi Engineering Honors Society, 2014-Present

Upsilon Pi Epsilon Honor Society, 2016-Present