Dan Adler

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RESEARCH INTERESTS

General: Ubiquitous Computing; Human-Computer Interaction; Applied AI/ML; Health Informatics; Mobile Health; Mental and Behavioral Health

Specific: Mathematical and predictive modeling with multimodal, longitudinal behavioral data; User studies to design health interventions that combine algorithmic outputs and data collected from ubiquitous technologies and clinical sources to end user actions; Auditing machine learning tools to evaluate reliability and validity by measuring algorithmic fairness and bias

Applications: Clinical decision support in mental and behavioral healthcare; Health service quality measure design; Digital epidemiology

EDUCATION

Doctor of Philosophy   2019-Present
Cornell University
Information Science
NSF Graduate Research Fellow
Thesis Committee: Tanzeem Choudhury, PhD (Chair); Deborah Estrin, PhD; Fei Wang, PhD
Expected graduation in May 2025. I will be on the academic job market in Fall 2024.

Master of Science   2022
Cornell University
Information Science

Bachelor of Science, GPA 3.91/4.00   2016
The Johns Hopkins University
Double Major in Biomedical Engineering and Applied Mathematics and Statistics
Minor in Computer Science (CS). Specializations in computational biology and optimization.

PROFESSIONAL EXPERIENCE

PiTech Fellow   2024-Present
Medicare Rights Center
Building AI tools to help Medicare beneficiaries access and navigate health services. Funded through a Siegel PiTech PhD Impact Fellowship.

Graduate Student Researcher   2021-2022

Optum Labs, UnitedHealth Group (UHG)
Integrated patient-generated health data into collaborative care programs to improve mental health risk stratification and treatment outcomes.

Graduate Research Assistant 2019-Present
People-Aware Computing Lab, Cornell University
Under the direction of Professor Tanzeem Choudhury.

Educator & Course Developer 2018-2019
Coder Academy
Developed and delivered the first Technology Academy at Australia Post, a program aimed to reskill individuals from non-traditional backgrounds for careers in technology. Through the program, we reskilled 20 individuals who were hired into technology roles at Australia Post.

Associate 2016-2018
Advisory Analytics, PricewaterhouseCoopers (PwC)
Developed public health investmentment strategies for health systems by analyzing public and proprietary clinical and SDoH data with statistical, machine learning, and simulation models.

FELLOWSHIPS, HONORS, AWARDS

Siegal Public Interest Technology PhD Impact Fellow 2024
Digital Life Initiative Doctoral Fellow 2022
National Science Foundation Graduate Research Fellow 2021
Cornell Machine Learning in Medicine Best Poster Award 2022
Cornell InfoSci Departmental Service Award 2022
Biomedical Engineering Richard J. Johns Academic Achievement Award 2016
Biomedical Engineering Departmental Honors 2016
Applied Mathematics and Statistics Departmental Honors 2016
Johns Hopkins University Honors 2016
Applied Mathematics and Statistics Mathematical Modeling Award 2015

SELECTED PUBLICATIONS

1. **Daniel A. Adler**, Caitlin A. Stamatis, Jonah Meyerhoff, David C. Mohr, Fei Wang, Gabriel J. Aranovich, Srijan Sen and Tanzeem Choudhury. Measuring algorithmic bias to analyze the reliability of AI tools that predict depression risk using smartphone sensed-behavioral data. npj Mental Health Research 3, 1: 1-11. `https://doi.org/10.1038/s44184-024-00057-y`

2. Angel H.-C. Hwang, **Daniel A. Adler**, Meir Friedenberg and Qian Yang. Societal-Scale Human-AI Interaction Design? How Hospitals and Companies are Integrating Pervasive Sensing into Mental Healthcare. Accepted to the 2024 ACM Conference on Human Factors in Computing Systems (CHI). Link to accepted version.

3. Yuewen Yang*, Thalia Viranda*, Anna R. Van Meter, Tanzeem Choudhury and **Daniel A. Adler**. Exploring Opportunities to Augment Psychotherapy with Language Models. Accepted to the 2024 ACM Conference on Human Factors in Computing Systems (CHI).
   * Indicates equal contribution.

4. Neha Manjunath*, Ze Yuan Li*, Eunsol Soul Choi*, Srijan Sen, Fei Wang and **Daniel A. Adler**. Can Data Augmentation Improve Daily Mood Prediction from Wearable Data? An Empirical Study. Adjunct Proceedings of the 2023 ACM International Joint Conference on Pervasive and Ubiquitous Computing & the 2023 ACM International Symposium on Wearable Computing. `https://doi.org/10.1145/3594739.3612876`
Indicates equal contribution.

5. Jodie Nghiem*, **Daniel A. Adler***, Deborah Estrin, Cecilia Livesey and Tanzeem Choudhury. 2023. Understanding Mental Health Clinicians' Perceptions and Concerns Regarding Using Passive Patient-generated Health Data for Clinical Decision Making: a Qualitative, Semi-structured Interview Study. JMIR Formative Research 7, 1: e47380. `https://formative.jmir.org/2023/1/e47380`
Indicates equal contribution.

6. **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. `https://dl.acm.org/doi/10.1145/3555531`
Indicates equal contribution.

7. **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`

8. 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`

9. **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`

10. **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`

11. **Daniel A Adler**, Dror Ben-Zeev, Vincent W.-S. Tseng, John M. Kane, Andrew T. Campbell, Marta Hauser, Emily A. Scherer and Tanzeem Choudhury. 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`

INVITED TALKS AND POSTERS

1. Beyond Detection: New Opportunities for Machine Learning in Mental Healthcare. To be presented at the Conference for Health Inference and Learning (CHIL) in New York, NY. 28 June 2024. Poster and in-person talk.

2. Beyond Detection: New Opportunities for AI in Mental Healthcare. Presented at the Mila Health AI Reading Group. 12 February 2024. Virtual talk.

3. Personal sensing in mental healthcare: towards responsible development and implementation. Presented at the Center for Behavioral Intervention Technologies (CBITs) at Northwestern University's Digital Mental Health Seminar. 2 May 2023. Virtual talk.

4. Mental Health Digital Biomarkers: Moving from Research to Implementation. Presented at the AI and Defence: Readiness, Resilience and Mental Health Workshop, a part of the UK's Defence Science and Technology Laboratory's (Dstl) AI Fest 5. 31 March 2023. Virtual talk.

5. Mental Health Digital Biomarkers: Moving from Research to Practice. Presented at the Cornell Tech Digital Life Initiative Seminar in New York, NY. 9 March 2023. In-person talk.

6. Burnout and the Quantified Workplace: Tensions around Personal Sensing Interventions for Stress in Resident Physicians. Presented at the ACM Computer Supported Cooperative Work (CSCW) Conference. 8-22 November 2022. Virtual talk.

7. Are mental health digital biomarkers reliable? Presented at the Nature Medicine in a Virtual Age Conference. 5-6 October 2022. Virtual poster session.

8. Identifying Mobile Sensing Indicators of Stress-Resilience. Presented at the ACM UbiComp Conference in Atlanta, GA. 14 September 2022. In-person talk.

9. Are mental health digital biomarkers reliable? Presented to the Data Science for Mental Health Special Interest Group (DS4MH) at The Alan Turing Institute. 21 July 2022. Virtual talk.

10. Machine learning for passive mental health symptom prediction: generalization across different longitudinal mobile sensing studies. Presented at Cornell's Machine Learning in Medicine Symposium in New York, NY. 6 June 2022. In-person poster session.

11. Developing generative adversarial networks to predict individual-level mental health symptoms. Presented at the Cornell Artificial Intelligence Seminar. 25 September 2020. Virtual talk.

PATENTS

17/551,994: System implementing encoder-decoder neural network adapted to prediction in behavioral and/or physiological contexts

18/026,371: System implementing generative adversarial network adapted to prediction in behavioral and/or physiological contexts

TEACHING

Cornell Tech INFO 5610 Precision Behavioral Health Lead Instructor Fall 2023
Cornell Tech INFO 5375 Machine Learning in Health 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, Course Developer and Lead Instructor 2019

Coder Academy Data Science Masterclasses, Course Developer and Lead Instructor 2019
TEALS (Microsoft Philanthropies) Computer Science Teacher Fall 2017, Spring 2018
PwC Python Bootcamp Developer and Instructor Fall 2017, Spring 2018
PwC R Bootcamp Developer and Instructor Spring 2017
Johns Hopkins BME 580.222 Signals, Systems and Controls TA Spring 2016
Johns Hopkins AMS 550.111 Statistical Analysis 1 TA Fall 2015

SERVICE

Workshop Organizing:
UbiComp Mental Health Workshop Co-leader 2023, 2024
UbiComp Mental Health Workshop Co-organizer 2022

Technical Program Committee:
Conference on Affective Computing and Intelligent Interaction (ACII) 2024
UbiComp FairComp Workshop 2024
International Conference on Multimodal Interaction (ICMI) 2023, 2024
KDD Health Day 2022

Campus Service:
PhDs at Cornell Tech (PACT) Hiring Committee Officer 2022
InfoSci Graduate Student Association (ISGSA) Admissions Representative 2020-2021
Tau Beta Pi Engineering Honors Society Maryland Alpha (JHU) Chapter President 2015-2016

Community Service:
Big Brothers Big Sisters (BBBS) of NYC Big Brother 2021-2022
TEALS (Microsoft Philanthropies) Course Instructor 2017-2018
THREAD Head of Family 2015-2016

Reviewer:
PACM on Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT)
PACM on Human-Computer Interaction
ACM Conference on Human Factors in Computing Systems (CHI)
ACM Transactions on Computer-Human Interaction
ACM Transactions on Computing for Healthcare
ACM Symposium on User Interface Software and Technology (UIST)
npj Digital Medicine
npj Mental Health Research
Journal of Biomedical Informatics
Journal of Medical Internet Research (JMIR)
JAMA Psychiatry
Frontiers in Psychiatry
PLOS One

Professional Organizations:
Association for Computing Machinery
Society for Digital Mental Health

Tau Beta Pi Engineering Honors Society
Upsilon Pi Epsilon Honors Society for Computing and Information Disciplines

GRANT PROPOSALS

1. Cornell Multi Investigator Seed Grant. Improving the Robustness of Mobile Sensing and AI Systems for Mental Health Care. PIs: Qian Yang and Fei Wang. Senior personnel: **Daniel A. Adler**. Contributed to preliminary analysis and grant writing. **Awarded in 2022**.

2. Cornell Multi Investigator Seed Grant. Analyzing reliability in data-driven mental health measurement using personal sensing data. PIs: Tanzeem Choudhury and Fei Wang. Contributed to preliminary analysis and wrote the grant proposal. **Awarded in 2022**.

3. NSF Graduate Research Fellowship. Title: Pretrained Embeddings from Mobile Sensing Data for Mental Health Symptom Prediction. **Awarded in 2021**.

4. Microsoft Azure Cloud Computing Grant. PIs: Tanzeem Choudhury and **Daniel A. Adler**. Wrote grant proposal. **Awarded in 2021**.

5. NIH R01. Title: Combining conversational signals and behavioral biomarkers to predict treatment discontinuation, therapeutic alliance, and symptom changes in asynchronous online therapy. PIs: Tanzeem Choudhury, Cristian Danescu-Niculescu-Mizil, John M. Kane and David C. Mohr. Contributed to preliminary analysis and grant writing. Not awarded.

REFERENCES

Tanzeem Choudhury, PhD
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David C. Mohr, PhD
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Director, Institute of Artificial Intelligence for Digital Health
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