Weichen Wang

6211 Sudikoff Lab
Hanover, NH
✉ *weichen.wang.gr@dartmouth.edu*
https://weichen.wang

Research Area

Ubiquitous Computing, Mobile Sensing Systems, Mobile Health, Mobile Sensing Applied Machine Learning and Data Mining.

Education

2015–Now **Ph.D., Computer Science**.
Dartmouth College, Hanover, NH, USA

2010–2012 **M.E., Information, Production and Systems**.
Waseda University, Japan

2006–2010 **B.E., Software Engineering**.
Nanjing University, China

Industry Experience

Dec 2021–Present **Meta Platforms, Inc. (formerly known as Facebook, Inc.)**, *Research Scientist*, Menlo Park, CA, USA.

Jun 2020–Sep 2020 **Facebook, Inc.**, *Software Engineer Intern*, Seattle, WA, USA.
Enhanced the revenue ads ranking auto-calibration process through feature selection, ensuring that the prediction models for ads impressions and conversions are properly calibrated.

Jun 2019–Aug 2019 **AT&T Labs, Inc.**, *Research Intern*, Bedminster, NJ, USA.
Investigated a novel game design on a 5G programmable network at AT&T Labs Research. Built the new architecture on top of an open-source classic MMO game engine in order to offer in-game network control based on a 5G intelligent network. The new game design optimizes resource allocation for video games, as well as cloud/edge traffic routing and on-demand backend server placement.

Oct 2014–Aug 2015 **Works Applications CO.,LTD.**, *DevOps Engineer*, Tokyo, Japan.
WorksApp is Japan's leading enterprise resource planning solution provider, assisting big corporations across a wide range of industries, including manufacturing, construction, distribution, transportation, service, finance, and public utility business.
- As a DevOps engineer, improved, implemented, and provided technical support for the commuting-cost module in Japan's No. 1 human resource management software product's payroll accounting system (with a 50% market share in 2015).
- Contributed to the development of the next-generation commuting-cost module (backend: COBOL to Java; frontend: Delhpi to Web).

Oct 2012–Sep 2014 **KLab Inc.**, *Software Engineer*, Tokyo, Japan.
In the year that smart phone games began to take off in Japan, I joined KLab, a well-known mobile game company.
- Created mobile game services to facilitate large-scale correspondences.
- Contributed to the game server's architectural design.
- Mentored junior team members in the development of web-based tools for managing game settings and tracking user behavior.

Research Activities

Sep 2015–Now **Dartmouth College (Computer Science Department)**, *Research Assistant*, Hanover, NH, USA.

I primarily work with ubiquitous sensing devices such as mobile phones and wearables, designing apps that are capable of connecting to and communicating with a variety of devices and technologies. My human-centered studies make extensive use of such apps to track individuals in the wild, resulting in a vast amount of noisy longitudinal data from real-world settings. My research entails conducting various studies on such multi-modal data using machine learning and deep learning techniques in order to analyze and predict human behavior, performance and well-being. Following are some of my responsibilities:

- Created mobile sensing frameworks for Android and iOS devices.
- Created backend infrastructure to store, analyse, and visualize data collected by smartphones.
- Created a recruiting website to screen and enroll research participants from around the United States.
- Worked with PIs from other disciplines, especially psychologists, psychiatrists, and brain scientists, to distill research challenges and give technique solutions.
- Led mobile sensing system design, data collection and cleaning, feature engineering, and machine learning modeling for various NSF/NIH mobile sensing projects at Dartmouth College, including NIMH 1R01MH112641, NIMH 5R01MH059282 and NSF BCS-1520288.
- Published novel research in mobile sensing, machine learning, and human behavioral modeling at top-ranked journals and conferences in Computer Science, including IMWUT'17, IMWUT'18, IMWUT'19, IMWUT'20, CHI'20, and CHI'22.

Technology stack: Python, Java, Android, Objective-C, Bash, TensorFlow, PyTorch, Scikit-learn, MongoDB, MySQL, JavaScript, HTTP, CSS, Flask, Git, AWS.

Peer-Reviewed Research Publications

Note: CV author in bold.
(Google Scholar: cited 1,200 times; top 10 cited 1,071 times; H-index 14) as of 2022/05/20

[28] Subigya Nepal, **Weichen Wang**, Vlado Vojdanovski, Jeremy F Huckins, Alex daSilva, Meghan Meyer, and Andrew Campbell. "COVID Student Study: A Year in the Life of College Students during the COVID-19 Pandemic Through the Lens of Mobile Phone Sensing". In: *CHI Conference on Human Factors in Computing Systems*. CHI '22. New Orleans, LA, USA: Association for Computing Machinery, 2022. ISBN: 9781450391573. DOI: 10.1145/3491102.3502043. URL: https://doi.org/10.1145/3491102.3502043.

[27] Weizhe Xu, **Weichen Wang**, Jake Portanova, Ayesha Chander, Andrew Campbell, Serguei Pakhomov, Dror Ben-Zeev, and Trevor Cohen. "Fully automated detection of formal thought disorder with Time-series Augmented Representations for Detection of Incoherent Speech (TARDIS)". In: *Journal of Biomedical Informatics* 126 (2022), p. 103998. ISSN: 1532-0464. DOI: https://doi.org/10.1016/j.jbi.2022.103998. URL: https://www.sciencedirect.com/science/article/pii/S1532046422000144.

[26] Subigya Nepal, **Weichen Wang**, Bishal Sharma, and Prabesh Paudel. "Current Practices in Mental Health Sensing". In: *XRDS* 28.1 (Sept. 2021), pp. 28–33. ISSN: 1528-4972. DOI: 10.1145/3481829. URL: https://doi.org/10.1145/3481829.

[25] Benjamin Buck, Ayesha Chander, Rachel M Brian, **Weichen Wang**, Andrew T Campbell, and Dror Ben-Zeev. "Expanding the Reach of Research: Quantitative Evaluation of a Web-Based Approach for Remote Recruitment of People Who Hear Voices". In: *JMIR Form Res* 5.6 (June 2021), e23118. ISSN: 2561-326X. DOI: 10.2196/23118. URL: http://www.ncbi.nlm.nih.gov/pubmed/34081011.

[24] Dante L Mack, Alex W DaSilva, Courtney Rogers, Elin Hedlund, Eilis I Murphy, Vlado Vojdanovski, Jane Plomp, **Weichen Wang**, Subigya K Nepal, Paul E Holtzheimer, Dylan D Wagner, Nicholas C Jacobson, Meghan L Meyer, Andrew T Campbell, and Jeremy F Huckins. "Mental Health and Behavior of College Students During the COVID-19 Pandemic: Longitudinal Mobile Smartphone and Ecological Momentary Assessment Study, Part II". In: *J Med Internet Res* 23.6 (June 2021), e28892. ISSN: 1438-8871. DOI: 10.2196/28892. URL: http://www.ncbi.nlm.nih.gov/pubmed/33900935.

[23] **Weichen Wang**, Jialing Wu, Subigya Kumar Nepal, Alex daSilva, Elin Hedlund, Eilis Murphy, Courtney Rogers, and Jeremy F. Huckins. "On the Transition of Social Interaction from In-Person to Online: Predicting Changes in Social Media Usage of College Students during the COVID-19 Pandemic Based on Pre-COVID-19 On-Campus Colocation". In: *Proceedings of the 2021 International Conference on Multimodal Interaction*. New York, NY, USA: Association for Computing Machinery, 2021, pp. 425–434. ISBN: 9781450384810. URL: https://doi.org/10.1145/3462244.3479888.

[22] Bishal Lamichhane, Dror Ben-Zeev, Andrew Campbell, Tanzeem Choudhury, Marta Hauser, John Kane, Mikio Obuchi, Emily Scherer, Megan Walsh, Rui Wang, **Weichen Wang**, and Akane Sano. "Patient-Independent Schizophrenia Relapse Prediction Using Mobile Sensor Based Daily Behavioral Rhythm Changes". In: *Wireless Mobile Communication and Healthcare*. Ed. by Juan Ye, Michael J. O'Grady, Gabriele Civitarese, and Kristina Yordanova. Cham: Springer International Publishing, 2021, pp. 18–33. ISBN: 978-3-030-70569-5.

[21] Alex W. daSilva, Jeremy F. Huckins, **Weichen Wang**, Rui Wang, Andrew T. Campbell, and Meghan L. Meyer. "Daily perceived stress predicts less next day social interaction: Evidence from a naturalistic mobile sensing study." In: *Emotion* 21.8 (2021), pp. 1760–1770. DOI: 10.1037/emo0000994. URL: https://doi.org/10.1037/emo0000994.

[20] Dror Ben-Zeev, Benjamin Buck, Ayesha Chander, Rachel Brian, **Weichen Wang**, David Atkins, Carolyn J Brenner, Trevor Cohen, Andrew Campbell, and Jeffrey Munson. "Mobile RDoC: Using Smartphones to Understand the Relationship Between Auditory Verbal Hallucinations and Need for Care". In: *Schizophrenia Bulletin Open* 1.1 (Nov. 2020). sgaa060. ISSN: 2632-7899. DOI: 10.1093/schizbullopen/sgaa060. eprint: https://academic.oup.com/schizbullopen/article-pdf/1/1/sgaa060/34604174/sgaa060.pdf. URL: https://doi.org/10.1093/schizbullopen/sgaa060.

[19] Vincent W.-S. Tseng, Akane Sano, Dror Ben-Zeev, Rachel Brian, Andrew T. Campbell, Marta Hauser, John M. Kane, Emily A. Scherer, Rui Wang, **Weichen Wang**, Hongyi Wen, and Tanzeem Choudhury. "Using behavioral rhythms and multi-task learning to predict fine-grained symptoms of schizophrenia". In: *Scientific Reports* 10.1 (Sept. 2020), p. 15100. ISSN: 2045-2322. DOI: 10.1038/s41598-020-71689-1. URL: https://doi.org/10.1038/s41598-020-71689-1.

[18] Jeremy F Huckins, Alex W DaSilva, Elin L Hedlund, Eilis I Murphy, Courtney Rogers, **Weichen Wang**, Mikio Obuchi, Paul E Holtzheimer, Dylan D Wagner, and Andrew T Campbell. "Causal Factors of Anxiety and Depression in College Students: Longitudinal Ecological Momentary Assessment and Causal Analysis Using Peter and Clark Momentary Conditional Independence". In: *JMIR Ment Health* 7.6 (June 2020), e16684. ISSN: 2368-7959. DOI: 10.2196/16684. URL: http://www.ncbi.nlm.nih.gov/pubmed/32519971.

[17] Jeremy F Huckins, Alex W daSilva, **Weichen Wang**, Elin Hedlund, Courtney Rogers, Subigya K Nepal, Jialing Wu, Mikio Obuchi, Eilis I Murphy, Meghan L Meyer, Dylan D Wagner, Paul E Holtzheimer, and Andrew T Campbell. "Mental Health and Behavior of College Students During the Early Phases of the COVID-19 Pandemic: Longitudinal Smartphone and Ecological Momentary Assessment Study". In: *J Med Internet Res* 22.6 (June 2020), e20185. ISSN: 1438-8871. DOI: 10.2196/20185. URL: http://www.ncbi.nlm.nih.gov/pubmed/32519963.

[16] Mikio Obuchi, Jeremy F. Huckins, **Weichen Wang**, Alex daSilva, Courtney Rogers, Eilis Murphy, Elin Hedlund, Paul Holtzheimer, Shayan Mirjafari, and Andrew Campbell. "Predicting Brain Functional Connectivity Using Mobile Sensing". In: *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 4.1 (Mar. 2020). DOI: 10.1145/3381001. URL: https://doi.org/10.1145/3381001.

[15] **Weichen Wang**, Shayan Mirjafari, Gabriella Harari, Dror Ben-Zeev, Rachel Brian, Tanzeem Choudhury, Marta Hauser, John Kane, Kizito Masaba, Subigya Nepal, Akane Sano, Emily Scherer, Vincent Tseng, Rui Wang, Hongyi Wen, Jialing Wu, and Andrew Campbell. "Social Sensing: Assessing Social Functioning of Patients Living with Schizophrenia Using Mobile Phone Sensing". In: *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*. New York, NY, USA: Association for Computing Machinery, 2020, pp. 1–15. ISBN: 9781450367080. URL: https://doi.org/10.1145/3313831.3376855.

[14] Rui Wang, **Weichen Wang**, Mikio Obuchi, Emily Scherer, Rachel Brian, Dror Ben-Zeev, Tanzeem Choudhury, John Kane, Martar Hauser, Megan Walsh, and Andrew Campbell. "On Predicting Relapse in Schizophrenia using Mobile Sensing in a Randomized Control Trial". In: *2020 IEEE International Conference on Pervasive Computing and Communications (PerCom)*. 2020, pp. 1–8. DOI: 10.1109/PerCom45495.2020.9127365.

[13] Sandrine R. Müller, Heinrich Peters, Sandra C. Matz, **Weichen Wang**, and Gabriella M. Harari. "Investigating the Relationships between Mobility Behaviours and Indicators of Subjective Well–Being Using Smartphone–Based Experience Sampling and GPS Tracking". In: *European Journal of Personality* 34.5 (2020), pp. 714–732. DOI: 10.1002/per.2262. eprint: https://doi.org/10.1002/per.2262. URL: https://doi.org/10.1002/per.2262.

[12] Gabriella M Harari, Sandrine R Müller, Clemens Stachl, Rui Wang, **Weichen Wang**, Markus Bühner, Peter J Rentfrow, Andrew T Campbell, and Samuel D Gosling. "Sensing sociability: Individual differences in young adults' conversation, calling, texting, and app use behaviors in daily life." In: *Journal of personality and social psychology* 119.1 (2020), p. 204.

[11] Shayan Mirjafari, Kizito Masaba, Ted Grover, **Weichen Wang**, Pino Audia, Andrew T. Campbell, Nitesh V. Chawla, Vedant Das Swain, Munmun De Choudhury, Anind K. Dey, Sidney K. D'Mello, Ge Gao, Julie M. Gregg, Krithika Jagannath, Kaifeng Jiang, Suwen Lin, Qiang Liu, Gloria Mark, Gonzalo J. Martinez, Stephen M. Mattingly, Edward Moskal, Raghu Mulukutla, Subigya Nepal, Kari Nies, Manikanta D. Reddy, Pablo Robles-Granda, Koustuv Saha, Anusha Sirigiri, and Aaron Striegel. "Differentiating Higher and Lower Job Performers in the Workplace Using Mobile Sensing". In: *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 3.2 (June 2019). DOI: 10.1145/3328908. URL: https://doi.org/10.1145/3328908.

[10] Alex W DaSilva, Jeremy F Huckins, Rui Wang, **Weichen Wang**, Dylan D Wagner, and Andrew T Campbell. "Correlates of Stress in the College Environment Uncovered by the Application of Penalized Generalized Estimating Equations to Mobile Sensing Data". In: *JMIR Mhealth Uhealth* 7.3 (Mar. 2019), e12084. ISSN: 2291-5222. DOI: 10.2196/12084. URL: http://www.ncbi.nlm.nih.gov/pubmed/30888327.

[9] Jeremy F. Huckins, Alex W. daSilva, Rui Wang, **Weichen Wang**, Elin L. Hedlund, Eilis I. Murphy, Richard B. Lopez, Courtney Rogers, Paul E. Holtzheimer, William M. Kelley, Todd F. Heatherton, Dylan D. Wagner, James V. Haxby, and Andrew T. Campbell. "Fusing Mobile Phone Sensing and Brain Imaging to Assess Depression in College Students". In: *Frontiers in Neuroscience* 13 (2019). ISSN: 1662-453X. DOI: 10.3389/fnins.2019.00248. URL: https://www.frontiersin.org/article/10.3389/fnins.2019.00248.

[8] Benjamin Buck, Kevin A. Hallgren, Emily Scherer, Rachel Brian, Rui Wang, **Weichen Wang**, Andrew Campbell, Tanzeem Choudhury, Marta Hauser, John M. Kane, and Dror Ben-Zeev. "Capturing behavioral indicators of persecutory ideation using mobile technology". In: *Journal of Psychiatric Research* 116 (2019), pp. 112–117. ISSN: 0022-3956. DOI: https://doi.org/10.1016/j.jpsychires.2019.06.002. URL: https://www.sciencedirect.com/science/article/pii/S0022395619300238.

[7] Benjamin Buck, Emily Scherer, Rachel Brian, Rui Wang, **Weichen Wang**, Andrew Campbell, Tanzeem Choudhury, Marta Hauser, John M. Kane, and Dror Ben-Zeev. "Relationships between smartphone social behavior and relapse in schizophrenia: A preliminary report". In: *Schizophrenia Research* 208 (2019), pp. 167–172. ISSN: 0920-9964. DOI: https://doi.org/10.1016/j.schres.2019.03.014. URL: https://www.sciencedirect.com/science/article/pii/S0920996419301082.

[6] **Weichen Wang**, Gabriella M. Harari, Rui Wang, Sandrine R. Müller, Shayan Mirjafari, Kizito Masaba, and Andrew T. Campbell. "Sensing Behavioral Change over Time: Using Within-Person Variability Features from Mobile Sensing to Predict Personality Traits". In: *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 2.3 (Sept. 2018). DOI: 10.1145/3264951. URL: https://doi.org/10.1145/3264951.

[5] Rui Wang, **Weichen Wang**, Min Hane Aung, Dror Ben-Zeev, Rachel Brian, Andrew T. Campbell, Tanzeem Choudhury, Marta Hauser, John Kane, Emily A. Scherer, and Megan Walsh. "Predicting Symptom Trajectories of Schizophrenia Using Mobile Sensing". In: *GetMobile: Mobile Comp. and Comm.* 22.2 (Sept. 2018), pp. 32–37. ISSN: 2375-0529. DOI: 10.1145/3276145.3276157. URL: https://doi.org/10.1145/3276145.3276157.

[4] Rui Wang, **Weichen Wang**, Alex daSilva, Jeremy F. Huckins, William M. Kelley, Todd F. Heatherton, and Andrew T. Campbell. "Tracking Depression Dynamics in College Students Using Mobile Phone and Wearable Sensing". In: *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 2.1 (Mar. 2018). DOI: 10.1145/3191775. URL: https://doi.org/10.1145/3191775.

[3] Rui Wang, **Weichen Wang**, Min S. H. Aung, Dror Ben-Zeev, Rachel Brian, Andrew T. Campbell, Tanzeem Choudhury, Marta Hauser, John Kane, Emily A. Scherer, and Megan Walsh. "Predicting Symptom Trajectories of Schizophrenia Using Mobile Sensing". In: *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 1.3 (Sept. 2017). DOI: 10.1145/3130976. URL: https://doi.org/10.1145/3130976.

[2] Gabriella M. Harari, **Weichen Wang**, Sandrine R. Müller, Rui Wang, and Andrew T. Campbell. "Participants' Compliance and Experiences with Self-Tracking Using a Smartphone Sensing App". In: UbiComp '17. Maui, Hawaii: Association for Computing Machinery, 2017, pp. 57–60. ISBN: 9781450351904. DOI: 10.1145/3123024.3123164. URL: https://doi.org/10.1145/3123024.3123164.

[1] Dror Ben-Zeev, Rachel Brian, Rui Wang, **Weichen Wang**, Andrew T. Campbell, Min S. H. Aung, Michael Merrill, Vincent W. S. Tseng, Tanzeem Choudhury, Marta Hauser, John M. Kane, and Emily A. Scherer. "CrossCheck: Integrating self-report, behavioral sensing, and smartphone use to identify digital indicators of psychotic relapse." In: *Psychiatric Rehabilitation Journal* 40.3 (2017), pp. 266–275. DOI: 10.1037/prj0000243. URL: https://doi.org/10.1037/prj0000243.

Academic Service - Reviewers

2022 **ACM CHI, ACM IMWUT**.

2020 **ACM IMWUT, ACM CSCW**.

2019 **ACM IMWUT**.

2018 **ACM IMWUT**.

Teaching Assistantship

Spring, 2020 **CS65: Smartphone Programming**, Dartmouth College.

Fall, 2018 **CS58: Operating Systems**, Dartmouth College.

Languages

Chinese.
Native

English.
Full professional proficiency

Japanese.
Professional working proficiency