JINGPING NIE

Assistant Professor in the School of Data Science and Society, University of North Carolina at Chapel Hill
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RESEARCH INTERESTS

Human-centric health-oriented privacy-aware intelligent wearable devices, Artificial Intelligence of Things (AIoT), Internet of Medical Things (IoMT), ubiquitous sensing for fitness, wellness, health, and sustainability, and machine learning- (ML-) driven smart grids optimization. My research lies at the intersection of diverse disciplines, including electrical engineering, biomedical engineering, computer science, and data science.

EDUCATION

2019–2025 **Columbia University**, New York, NY
Ph.D., Electrical Engineering
Advisors: Prof. Xiaofan Jiang and Prof. Matthias Preindl

2017–2019 **Columbia University**, New York, NY
M.S., Electrical Engineering
M.S. Honors Student

2013–2017 **Smith College**, Northampton, MA
B.S., Engineering Science
Magna cum laude with High Honors

Fall 2015 **Columbia University**, New York, NY
Visiting Student

PROFESSIONAL EXPERIENCE

July 2025 – Present **University of North Carolina at Chapel Hill**, Chapel Hill, NC, USA
Assistant Professor, School of Data Science and Society
Core Faculty Member, Carolina Health Informatics Program

Summer 2024 **Apple Inc.**, Cupertino, CA, USA
Machine Learning Research Intern
Mentor: Vikramjit Mitra

Summer 2023 **Apple Inc.**, Cupertino, CA, USA
Machine Learning Research Intern
Mentor: Vikramjit Mitra

HONORS & AWARDS

2025 **Columbia Engineering Morton B. Friedman Memorial Prize** *(awarded annually to one PhD graduate across the entire School of Engineering)*

2025 Columbia University Eli Jury Award

2025 **CPS Rising Star**

2024 **Best Paper Award, *ACM MobiSys*** *(out of 263 submissions)*

2024 People's Choice Demo Award, *ACM MobiSys*

2023 **EECS Rising Star**

2023 **Apple Scholars in AI/ML PhD Fellowship** *(only 22 fellows were selected worldwide)*

2023 Columbia University Jacob Millman Award *(outstanding teaching assistant)*

2022 Best Demo Award Runner-up, *ACM SenSys*

2021 **Best Paper Award, *IEEE ITEC*** *(out of 226 submissions)*

2020 **Best Demo Award, *ACM/IEEE IPSN***

2018 Columbia Electrical Engineering M.S. Honors Student

2017 Phi Beta Kappa Honor Society, Smith College

2017 Sigma Xi Honor Society, Smith College

2013–2017 Dean's List, All Semesters at Smith College

2016 Tau Beta Kappa Honor Society, Smith College

GRANTS AND PREPARATION

NVIDIA Academic Grant
2025, NVIDIA, "Federated Multimodal LLM Home Therapist for Proactive Mental Wellness Support." (amount awarded: 2x RTX PRO 6000 Blackwell Max-Q Workstation Edition and 2x Jetson AGX Orin Dev Kit ($\approx 20,000$).
Contribution: sole PI.

Apple Scholars in AI/ML PhD Fellowship
2023–2025, Apple Inc., "Enabling Machines to *Understand* and *Take Care of* Humans: Intelligent and Privacy-Aware Wearable Devices and AIoT Systems" (amount awarded: annual tuition of $52,010 and stipend of $40,000, and $5,000 in conference travel support).
Contribution: I envisioned and wrote this proposal.

NSF CAREER
2020–2025, National Science Foundation, "CAREER: A Scalable Occupant-Driven Energy Optimization System for Commercial Buildings" (amount awarded: $535,838).
Contribution: Assisted PI Prof. Xiaofan Jiang in writing and preparing the grant proposal.

Columbia SEAS
2020–2022, Columbia SEAS, "Low-Cost Continuous Multi-Person Fever Detection for a Safer COVID-19 and Post-COVID-19 World" (amount awarded: $85,000).
Contribution: Assisted PI Prof. Xiaofan Jiang in writing and preparing the grant proposal.

Industry
2018, Sino-US Cyber-Physical Technology Co., "Gift: Smart Cities Research at Columbia Intelligent and Connected Systems" (amount awarded: $150,000).
Contribution: Assisted PI Prof. Xiaofan Jiang in writing and preparing the grant proposal.

Travel Grants
CPS-IoT Week 2025, CPS-IoT Week 2023, ACM MobiSys 2022, CPS-IoT week 2020

PUBLICATIONS

Journals

[6] **J. Nie**, Y. Fan, Z. Xuan, M. Zhao, R. Wan, M. Preindl, and X. Jiang, "SoundTrack: A Contactless Mobile Solution for Real-Time Running Metric Estimation for Treadmill Running in the Wild," *ACM Interact. Mob. Wearable Ubiquitous Technol.*, vol. 9, no. 2, 2025

[5] **J. Nie**, H. Shao, Y. Fan, Q. Shao, H. You, M. Preindl, and X. Jiang, "LLM-based Conversational AI Therapist for Daily Functioning Screening and Psychotherapeutic Intervention via Everyday Smart Devices," *ACM Transactions on Computing for Healthcare (HEALTH), Special Issue on Large Language Models, Conversational Systems, and Generative AI in Health*, 2025

[4] **J. Nie**, L. Zhou, M. F. Kaye, C. C. Silveira, A. Nwokolo, X. Jiang, and M. Preindl, "High-Performance Optimal Power Flow Estimation for EV-Interfaced Microgrids with Standardized Grid Services," *IEEE Transactions on Industry Applications*, vol. 59, no. 1, pp. 1199–1211, Jan. 2023

[3] Y. Liu, S. Xia, **J. Nie**, P. Wei, Z. Shu, J. Chang, and X. Jiang, "aiMSE: Towards an AI-based Online Mental Status Examination," *IEEE Pervasive Computing*, vol. 21, no. 4, pp. 46—54, 2022

[2] **J. Nie**, Y. Liu, Y. Hu, Y. Wang, S. Xia, M. Preindl and X. Jiang, "SPIDERS+: A Light-Weight, Wireless, and Low-Cost Glasses-based Wearable Platform for Emotion Sensing and Bio-signal Acquisition," *Elsevier-Pervasive and Mobile Computing Journal (PMC)*, vol. 75, pp. 101424, Aug. 2021

[1] **J. Nie**, GM. Di Liberto, J. Yeaton, B. Khalighinejad, S. Shamma, and N. Mesgarani, "Neural Representation of Linguistic Feature Hierarchy Reflects Second-Language Proficiency," *Elsevier NeuroImage*, vol. 227, pp. 117586, Feb. 2021

Conference Proceedings

[12] **J. Nie**, D. T. Dung, K. Thakkar, V. Kowtha, J. Huang, C. Avendano, E. Azemi, V. Mitra, "Foundation Model Hidden Representations for Heart Rate Estimation from Auscultation," in *Proc. of Interspeech 2025 (Interspeech'25)*, 2025

[11] **J. Nie**, Y. Fan, M. Zhao, R. Wan, Z. Xuan, M. Preindl, and X. Jiang, "Multi-Modal Dataset Across Exertion Levels: Capturing Post-Exercise Speech, Breathing, and Phonocardiogram," in *Proc. ACM Conference on Embedded Networked Sensor Systems (SenSys'25)*, 2025

[10] Q. Shao, J. Liu, E. Bejerano, H. M. Colman, **J. Nie**, X. Jiang, and X. Zhou, "Joey: Supporting Kangaroo Mother Care with Computational Fabrics," in *Proc. ACM International Conference on Mobile Systems, Applications, and Services (MobiSys'24)*, 2024
Best Paper Award and **People's Choice Demo Award**

[9] V. Mitra, **J. Nie**, and E. Azemi, "Investigating Salient Representations and Label Variance in Dimensional Speech Emotion Analysis," in *Proc. IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP'24)*, 2024

[8] S. Xia, M. Zhao, C. Adhivarahan, K. Hou, Y. Chen, **J. Nie**, E. Wu, K. Dantu, and X. Jiang, "Anemoi: A Low-cost Sensorless Indoor Drone System for Automatic Mapping of 3D Airflow Fields," in *Proc. ACM International Conference on Mobile Computing and Networking (MobiCom'23)*, 2023

[7] **J. Nie**, S. Xia, Y. Liu, S. Ding, L. Hu, M. Zhao, Y. Fan, M. Aty, M. Preindl, and X. Jiang, "A Data-Driven and Human-Centric EV Charging Recommendation System at City-Scale," in *Proc. ACM International Conference on Future Energy Systems (ACM e-Energy'23)*, 2023

[6] M. Zhao, S. Xia, K. Hou, **J. Nie**, A. Dhupar, and X. Jiang, "LegoSENSE: An Open and Modular Sensing Platform for Rapidly-Deployable IoT Applications," in *Proc. ACM/IEEE International Conference on Internet of Things Design and Implementation (IoTDI'23)*, 2023

[5] **J. Nie**, Y. Liu, L. Zhou, M. Preindl, and X. Jiang, "Deep Reinforcement Learning Based Approach for Optimal Power Flow of Microgrid with Grid Services Implementation," in *Proc. IEEE/AIAA Transportation Electrification Conference and Electric Aircraft Technology Symposium (ITEC+EATS'22)*, 2022

[4] Y. Liu, **J. Nie**, J. Sun, P. Wei, S. Xia, and X. Jiang, "SoFIT: Self-Orienting Camera Network for Floor Mapping and Indoor Tracking," in *Proc. IEEE Annual International Conference on Distributed Computing in Sensor Systems (DCOSS'22)*, 2022

[3] **J. Nie**, L. Zhou, M. F. Kaye, C. C. Silveira, A. Nwokolo, X. Jiang, and M. Preindl, "Optimal Power Flow Estimation of Microgrid Considering the Grid Services of EV Batteries," in *Proc. IEEE Transportation Electrification Conference and Expo (ITEC'21)*, 2021
Best Paper Award

[2] S. Xia, **J. Nie**, and X. Jiang, "CSafe: An Intelligent Audio Wearable Platform for ImprovingConstruction Worker Safety in Urban Environments," in *Proc. ACM/IEEE Information Processing in Sensor Networks (IPSN'21)*, 2021

[1] **J. Nie**, Y. Hu, Y. Wang, S. Xia, and X. Jiang, "SPIDERS: Low-Cost Wireless Glasses for Continuous In-Situ Bio-Signal Acquisition and Emotion Recognition," in *Proc. ACM/IEEE International Conference on Internet of Things Design and Implementation (IoTDI'20)*, 2020

Workshops

[7] Y. Wang, W. Xia, H. Yao, and **J. Nie**, "Breathing and Semantic Pause Detection and Exertion-Level Classification in Post-Exercise Speech," in *Proc. of the 3rd ACM International Workshop on Intelligent Acoustic Systems and Applications (IASA'25)*, 2025

[6] Y. Sui, Y. Zhang, Y. Liu, M. Zhao, K. Hou, **J. Nie**, X. Jiang, and S. Xia, "DomAIn: Towards Programless Smart Homes," in *Proc. of the 3rd International Workshop on Human-Centered Sensing, Modeling, and Intelligent Systems (HumanSys'25)*, 2025

[5] **J. Nie**, R. Liu, B. Mahasseni, E. Azemi, and V. Mitra, "Model-driven Heart Rate Estimation and Heart Murmur Detection based on Phonocardiogram," in *Proc. IEEE International Workshop on Machine Learning for Signal Processing (MLSP'24)*, 2024

[4] Y. Fan, **J. Nie**, X. Sun, and X. Jiang, "Exploring Foundation Models in Detecting Concerning Daily Functioning in Psychotherapeutic Context Based on Images from Smart Home Devices," in *Proc. IEEE International Workshop on Foundation Models for Cyber-Physical Systems & Internet of Things (FMSys'24)*, 2024

[3] R. Liu, E. L. Zippi, H. Pouransari, C. Sandino, **J. Nie**, H. Goh, E. Azemi, and A. Moin, "Frequency-Aware Masked Autoencoders for Multimodal Pretraining on Biosignals," in *Proc. ICLR Time Series for Health Workshop (ICLR'24 TS4H)*, 2024

[2] Z. Xuan, M. Liu, **J. Nie**, M. Zhao, S. Xia, and X. Jiang, "CaNRun: Non-Contact, Acoustic-based Cadence Estimation on Treadmills using Smartphones," in *Proc. ACM International Workshop on Intelligent Acoustic Systems and Applications (IASA'23)*, 2023

[1] **J. Nie**, H. Shao, M. Zhao, S. Xia, M. Preindl, and X. Jiang, "Conversational AI Therapist for Daily Function Screening in Home Environments," in *Proc. ACM International Workshop on Intelligent Acoustic Systems and Applications (IASA'22)*, 2022

Demos and Posters

[4] **J. Nie**, Y. Fan, Z. Xuan, M. Preindl, and X. Jiang, "Poster Abstract: Real-Time Non-Contact Estimation of Running Metrics on Treadmills using Smartphones," in *Proc. ACM International Conference on Mobile Computing and Networking (MobiCom'24)*, 2024

[3] **J. Nie**, M. Zhao, S. Xia, X. Sun, H. Shao, Y. Fan, M. Preindl, and X. Jiang, "Demo Abstract: AI Therapist for Daily Functioning Assessment and Intervention Using Smart Home Devices," in *Proc. ACM Conference on Embedded Networked Sensor Systems (SenSys'22)*, 2022
Best Demo Runner-up Award

[2] **J. Nie**, L. Hu, Y. Liu, Y. Fan, M. Preindl, and X. Jiang, "Poster Abstract: Human-centric data-driven optimization and recommendation in EV-interfaced grid at city scale," in *Proc. ACM International Conference on Systems for Energy-Efficient Buildings, Cities, and Transportation (BuildSys'22)*, 2022

[1] Y. Hu, **J. Nie**, Y. Wang, S. Xia, and X. Jiang, "Demo Abstract: Wireless Glasses for Non-contact Facial Expression Monitoring," in *Proc. ACM/IEEE Conference on Information Processing in Sensor Networks (IPSN'20)*, 2020
Best Demo Award

TEACHING EXPERIENCE

Instructor, UNC Chapel Hill, Chapel Hill, NC

Spring 2026 DATA 481: Data Science Practicum

Spring 2026 DATA 766: Leading Research Teams

Teaching Assistant, Columbia University, New York, NY

Spring 2023 ELEN 6908: Embedded AI

Spring 2021 ELEN 6767: Internet Economics, Engineering, and Society

Fall 2019 EECS 4764: IoT – Intelligent and Connected Systems

Spring 2018 ELEN 6767: Internet Economics, Engineering, and Society

PROFESSIONAL ACTIVITIES

Associate Editor — ACM Transactions on Computing for Healthcare; Elsevier Smart Health

Conference Services	Technical Program Committee, ACM SenSys 2026 Program Chair, ACM IASA 2025 Program Chair, ACM HumanSys 2025 Social Media Chair, ACM SenSys 2025 Program Chair, ACM HumanSys 2024 Social Media Chair, ACM BuildSys 2024 Publicity and Social Media Chair, IEEE FMSys 2024 Social Media Chair, ACM SenSys 2023 Web Chair, ACM e-Energy 2023 Session Chair, IEEE/AIAA ITEC+EATS 2022 Social Media Chair, ACM BuildSys 2021
Reviewer	ACM Transactions on Sensor Networks 2025 ACM CHI 2025 ACM Transactions on Internet of Things 2025 ACM Transactions on Computing for Healthcare 2025 ACM FMSys 2024 ACM CHI 2024 ACM Transactions on Computing for Healthcare 2024 ACM Transactions on Computing for Healthcare 2023 ACM IMWUT 2023 ACM Energy Informatics Review 2022 IEEE Transactions on Transportation Electrification 2020
Department Services	UNC Chapel Hill School of Data Science and Society, Graduate Student Admission Committee, 2026 UNC Chapel Hill School of Data Science and Society, Faculty Search Committee, 2025 – 2026 UNC Chapel Hill School of Data Science and Society, Seminar Series Committee, 2025 – 2026 Columbia University Electrical Engineering, Student Ambassadors, 2019 – 2025
Volunteer	ACM SIGCOMM 2023 CPS-IoT Week 2023 ITEC+EATS 2022 ACM SenSys/BuildSys 2019
Panelist	Ph.D. Internship, Fellowships, Awards Panel, Northwestern University, Oct. 2024 Life After Smith Panel, Smith College, MA, Oct. 2022
Outreach	Girls Science Day, Columbia University, Nov. 2023 Science Expo at The School of Columbia (TSC), The School at Columbia University, May 2023 Girls Science Day, Columbia University, Nov. 2022 Women in Science at Columbia (WISC) Undergraduate Mentoring Program, 2022–2023 Homework House Holyoke, Smith College, 2014–2015

SEMINAR TALKS

Fall 2025	Department of Computer Science, North Carolina State Univeristy *From Body Signals to Smart Environments: Embedded AI and Sensing for Wellness and Health*
Fall 2025	Electrical and Computer Engineering, Northwestern University *From Body Signals to Smart Environments: Embedded AI and Sensing for Wellness and Health*
Spring 2025	Department of Computer Science, Duke Univeristy *Embedded AI and Sensing for Wellness, Fitness, and Health: Intelligent and Pervasive Wearable Devices and AIoT Systems*
Spring 2025	Department of Electrical and Computer Engineering, Duke Univeristy *Embedded AI and Sensing for Wellness, Fitness, and Health: Intelligent and Pervasive Wearable Devices and AIoT Systems*
Spring 2025	School of Data Science and Society, University of North Carolina at Chapel Hill *Embedded AI and Sensing for Wellness, Fitness, and Health: Intelligent and Pervasive Wearable Devices and AIoT Systems*

Spring 2025 Department of Electrical and Computer Engineering, University of California, Santa Barbara
Embedded AI and Sensing for Wellness, Fitness, and Health: Intelligent and Pervasive Wearable Devices and AIoT Systems

MENTORING

Master Students
Yuyu Wang (2025 – Present)
Siying Chen (2025 – Present)
Yixin Zhang (2025 – Present)
James Ingram (Fall 2025)
Wuyue Xia (Fall 2025)
Yuang Fan (2023 – 2025, now a Ph.D. student at Columboa EE)
Hongyi Huo (Fall 2023, now at Palo Alto Networks)
Ziyi Xuan (2023 – 2024, now a Ph.D. student at Lehigh CSE)
Ming Liu (2023, now at EdgeTrace)
Gudmundur Mar Jonasson (Summer 2023, now at Better)
Lanxiang Hu (2022 – 2023, now a Ph.D. student at UCSD CSE)
Xinhua Sun (2022 – 2023, now a Ph.D. student at UW ECE)
Yukai Song (Summer 2022, now a Ph.D. student at University of Pittsburg ECE)
Yian Liu (Summer 2022)
Jinyao Wu (Spring 2022)
Michelle Marie Ray Santiago (Spring 2022)
Ria Sharma (Spring 2022, now at Pure Power Engineering)
Srivatsan Raveendran (Fall 2021, now at Tesla)
Santanab Mukhopadhyay (Fall 2021)
Avik Dhupar (2021 – 2022, now at STMicroelectronics)
Christine Silveira (2019 – 2021, now at Mott MacDonald)
Margaret Frances Kaye (2019 – 2021, now at Con Edison)
Afam Nwokolo (2019 – 2021, now at Clarapath)
Yanchen Liu (2019 – 2020, now a Ph.D. student at Columbia EE)
Jiajing Sun (2019 – 2020)
Peter Luca Malinverni (2019 – 2020)
Yuqing Zhu (Fall 2019)
Yigong Hu (2018 – 2020, now a Ph.D. student at UIUC ECE)

Undergraduate Students
Maya Enck (2026 – Present)
Arth Vijay (2026 – Present)
Xiangyuan Xue (2026 – Present)
Kexin Gen (2025 – Present)
Comfort Donkor (2025 – Present)
Kimberly Shao (Fall 2025)
Yutian Gong (Fall 2025)
Ruihan (Harry) Zhang (2025 – Present)
Mille Chen (Fall 2023)
Thilina Navod Balasooriya (Summer 2023)
Alfonso Rivas (Summer 2022, now an undergraduate student at Syracuse University)
Nia Cole (Summer 2022, now at JPMorgan Chase)
Mingyang Chen (Summer 2020, Visiting Student, M.S. student at UPenn)
Yuanyuting Wang (Summer 2019, now at Meta)
Andrew Gu (Summer 2019, Visiting Student, now an undergraduate student at CMU)
Henry Kiem (Summer 2018, now at Amazon Web Services

High School Students
Aiden Zhang (Summer 2025)
Runxi Wan (Summer 2024 – Sring 2025)
Elvin Ko (Summer 2019, now an undergraduate student at Columbia)
Alina Hassan (Summer 2019)
Kevin Huang (Summer 2019)

CERTIFICATIONS

2024 **Road Runner Club of America**
RRCA Level 1 Coaching

2023 **American Red Cross**
Adult, Child and Baby First Aid/CPR/AED