

Jianan Jian, PhD

Postdoctoral Associate

Fischell Department of Bioengineering, University of Maryland

4121 A. James Clark Hall, College Park, MD 20742

(857) 242-9099 • jnj@umd.edu

Education

PhD in Electrical and Computer Engineering, University of Pittsburgh, 01/2018 – 08/2021.

Dissertation: *Robust Design in Game Theory: Bayesian Optimization Approach to Minimax Problems with Equilibrium Constraint*.

MSc in Electrical Engineering, University of Pittsburgh, 09/2016 – 12/2017.

Thesis: *Modeling of Human Motor Control and Its Application in Human Interaction with Machines*.

MSc in Electrical Engineering, National Institute of Applied Sciences (INSA) Lyon, France, 09/2012 – 01/2019.

BS in Mathematics, Claude Bernard University Lyon 1, France, 09/2014 – 06/2015.

Research Experience

Postdoctoral Associate, Fischell Department of Bioengineering, University of Maryland, 04/2025 – current.

- Studying cortical causal functional connectivity using multimodal imaging data

Postdoctoral Associate, Department of Mathematics, University of Pittsburgh, 06/2023 – 09/2024.

Skills: statistical modeling, scientific programming, parallel computing, data analysis, data visualization

- Studied the diverse responses of SNr and MLR neurons to various stimuli in collaboration with experimental neuroscientists.
- Proposed a methodology to infer model parameters from experimental data through the relation between PRC and first-spike PSTH.
- Discovered the role of h-current in the resilience of SNr neurons to GPe inhibition and proposed the underlying mechanism.

Postdoctoral Associate, Department of Urology, University of Pittsburgh, 08/2021 – 06/2023.

Skills: animal surgery, cell culture, patch clamp, electrophysiology, mathematical modeling, scientific programming, grant writing.

- Proposed a novel neural conduction model of myelinated axons and conducted computer simulation for post-stimulation block analysis. [1]
- Conducted patch clamp experiments on primary DRG culture to study their responses to kHz stimulation in different extracellular conditions.
- Conducted animal experiments to demonstrate the feasibility of novel neuromodulation methods in potential clinical applications including pain management, urinary disorder treatment, and restoration of visceral functions in spinal cord injured individuals. [2] – [5]

Predoctoral Fellow, Department of Electrical and Computer Engineering, University of Pittsburgh, 01/2018 – 10/2020.

Skills: machine learning, data processing and analysis.

- Developed highly efficient supervised and unsupervised machine learning methods using data collected by distributed acoustic sensing (DAS) for 1) defect detection and classification in pipeline elbows 2) human movement classification. [7] – [13]

Graduate Student Researcher, Department of Electrical and Computer Engineering, University of Pittsburgh, 09/2016 – 08/2021.

Skills: applied mathematics, optimization methods, control theory and game theory.

- Proposed a novel game-theoretical framework for collaboration under uncertainty. [6]
- Studied false data injection attack in smart grid using game-theoretical model. [14]

Teaching Experience

University of Maryland

- Guest lecturer in BIOE 689N: *Special Topics in Bioengineering; Network Neuroscience and Brain Dynamic Analysis* (Spring 2025).

University of Pittsburgh

- Co-instructor in ECE 3695: *Deep Learning* (Spring 2018).
- Teaching assistant in ECE/COE 0031: *Linear Circuits and Systems* (Spring 2018).
- Co-instructor in ECE 3695: *Nonlinear Dynamics* (Fall 2017).
- Teaching assistant in ECE/COE 0031: *Linear Circuits and Systems* (Fall 2017).
- Teaching assistant in ECE 1710: *Power Distribution Systems Engineering and Smart Grids* (Summer 2017).
- Teaching assistant in ECE 1673: *Linear Control Systems* (Spring 2017).
- Teaching assistant in ECE 0132: *Digital Logic* (Fall 2016).

INSA Lyon, France

- Tutor in first year *Mathematics* (Fall 2014).
- Tutor in second year *Physics* (Spring 2015).

Professional Experience

- Volunteer Consultant at Fourth River Solutions, Pittsburgh, 09/2022 – current.
Mission: conducting market discovery, market analysis, competitive analysis, stakeholder interviews, delivering presentations, and writing white papers for early-stage startup clients.
- Software Engineering Intern at CNRS-LAPP, France, 09/2015 – 02/2016.
Mission: Graphical user interface (GUI) development in C++ for the configuration and parametrization of the Intelligent Platform Management Controller (IPMC) and Advanced Mezzanine Cards (AMC) firmware used at the CERN data acquisition system.
- Part-time trolley driver at Lyon Public Transport (TCL), France, 07/2014 – 06/2015.
- Electronics Repair Intern, Alstom Transport, France, 07/2013.

Professional Service & Leadership Activities

IEEE Pittsburgh Section

- Secretary (2025)
- Treasurer (2024)
 - Exemplary Section Award by IEEE Section 2
- Vice Chair (2023)
 - Exemplary Section Award by IEEE Section 2

University of Pittsburgh

- University Senate
 - a. Representative to the Community Relations Committee (09/2022 – 06/2024)
 - b. Representative to the Campus Utilization, Planning and Safety Committee (09/2023 – 06/2024)
- University of Pittsburgh Postdoctoral Association
 - a. Communication Chair (06/2022 – 05/2024)
- Pitt Alumni Association
 - a. Member of the Young Alumni Council (07/2022 – current)
 - b. Greater Pittsburgh Region Volunteer (03/2024 – current)
- Electrical and Computer Engineering Graduate Student Association
 - a. Event Coordinator (11/2017 – 12/2020)
- Journal *Ingenium: Undergraduate Research at the Swanson School of Engineering*
 - a. Co-Editor-in-Chief (2020)
 - b. Member of the Editorial Board (2017 – 2019)

Peer Review

- Reviewer for *PLOS One*, 2024.
- Reviewer for *Frontiers in Neuroscience*, 2022.
- Reviewer for *Spinal Cord - Nature*, 2022.
- Reviewer for *IEEE International Workshop on Machine Learning for Signal Processing*, 2019.
- Reviewer for *IEEE Transactions on Human-Machine Systems*, 2018.

Judging

- Pittsburgh Regional Science & Engineering Fair Category Judge (2023, 2024).
- University of Pittsburgh Postdoctoral Data & Dine Symposium (2023, 2024).
- University of Pittsburgh Swanson School of Engineering Design EXPO (2019 – 2024).

Award and Certification

- Second Place, 2023 Midwest Healthcare Case Competition.
- FDA Good Laboratory Practices Training, May 2023.
- *Leading People in Organizations* Micro-credential, Katz Graduate School of Business, University of Pittsburgh, 2022.
- *Principles of Synthetic Biology*, edX, 2017.

Peer-Reviewed Publications

1. **Jian, J.**, Beckel, J. M., de Groat, W. C., & Tai, C. (2023). Model Analysis of Post-Stimulation Block of a Myelinated Axon by Direct Current. *IEEE Transactions on Biomedical Engineering*.
2. **Jian, J.**, Wang, J., Shen, B., Shen, Z., Goosby, K., Scolieri, J., ... & Tai, C. (2023). Pudendal Nerve Block by Adaptively Stepwise Increasing the Intensity of High-Frequency (10 kHz) Biphasic Stimulation. *Neuromodulation: Technology at the Neural Interface*.
3. Pintauro, M., **Jian, J.**, Wang, J., Shen, B., Scolieri, J., Madhavaram, A., ... & Tai, C. (2023). Role of opioid and β -adrenergic receptors in bladder underactivity induced by prolonged pudendal nerve stimulation in cats. *Neurourology and Urodynamics*.
4. Shen, Z., Wang, J., Shen, B., **Jian, J.**, Goosby, K., Wang, W., ... & Tai, C. (2023). Penile Erection Induced by Stimulation of Sacral S1/S2 Spinal Root in Cats. *Neuromodulation: Technology at the Neural Interface*, 26(8), 1817-1822.
5. Shen, Z., Wang, J., Shen, B., **Jian, J.**, Goosby, K., Wang, W., ... & Tai, C. (2022). Penile Erection Induced by Stimulation of Sacral S1/S2 Spinal Root in Cats. *Neuromodulation: Technology at the Neural Interface*.
6. Shen, B., Wang, J., Shen, Z., **Jian, J.**, Goosby, K., Beckel, J., ... & Tai, C. (2022). Sacral neuromodulation of bladder underactivity induced by prolonged pudendal afferent firing in cats. *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology*, 322(6), R535-R541.
7. Chen, J., **Jian, J.**, Wang, J., Shen, Z., Shen, B., Wang, W., ... & Tai, C. (2021). Low pressure voiding induced by stimulation and 1 kHz post-stimulation block of the pudendal nerves in cats. *Experimental Neurology*, 346, 113860.
8. Wang, J., Shen, Z., Shen, B., **Jian, J.**, Hannan, T., Goosby, K., ... & Tai, C. (2021). Defecation induced by stimulation of sacral S2 spinal root in cats. *American Journal of Physiology-Gastrointestinal and Liver Physiology*, 321(6), G735-G742.
9. **Jian, J.**, Zeng, B., & Mao, Z. H. (2020). Multi-objective optimization approach to pure strategy equilibria in games with imperfect information. *IEEE Control Systems Letters*, 5(6), 2162-2167.
10. Peng, Z., Wen, H., **Jian, J.**, Gribok, A., Wang, M., Huang, S., ... & Chen, K. P. (2020). Identifications and classifications of human locomotion using Rayleigh-enhanced distributed fiber acoustic sensors with deep neural networks. *Scientific Reports*, 10(1), 1-11.
11. Peng, Z., **Jian, J.**, Wen, H., Gribok, A., Wang, M., Liu, H., ... & Chen, K. P. (2020). Distributed fiber sensor and machine learning data analytics for pipeline protection against extrinsic intrusions and intrinsic corruptions. *Optics Express*, 28(19), 27277-27292.
12. Wang, Q., **Jian, J.**, Wang, M., Wu, J., Mao, Z. H., Gribok, A. V., & Chen, K. P. (2020, June). Pipeline Defects Detection and Classification Based on Distributed Fiber Sensors and Neural Networks. In *Optical Fiber Sensors* (pp. W2B-3). Optical Society of America.
13. Peng, Z., Wen, H., **Jian, J.**, Wang, M., Liu, H., Mao, Z. H., & Chen, K. P. (2020, June). Detection and Identification of Human Locomotion by Distributed Acoustic Sensing with Deep Neural Networks. In *Optical Fiber Sensors* (pp. Th4-21). Optical Society of America.
14. Peng, Z., **Jian, J.**, Wang, M., Wang, Q., Boyer, T., Wen, H., ... & Chen, K. P. (2019, September). Big data analytics on fiber-optical distributed acoustic sensing with Rayleigh enhancements. In *2019 IEEE Photonics Conference (IPC)* (pp. 1-3). IEEE.
15. Peng, Z., **Jian, J.**, Wen, H., Wang, M., Liu, H., Jiang, D., ... & Chen, K. P. (2019, March). Fiber-optical distributed acoustic sensing signal enhancements using ultrafast laser and artificial intelligence for human movement detection and pipeline monitoring. In *Optical Data Science II* (Vol. 10937, pp. 53-60). SPIE.
16. Wen, H., Peng, Z., **Jian, J.**, Wang, M., Liu, H., Mao, Z. H., ... & Chen, K. P. (2018, October). Artificial intelligent pattern recognition for optical fiber distributed acoustic sensing systems based on phase-OTDR. In *Asia Communications and Photonics Conference* (pp. Su4B-1). Optica Publishing Group.
17. Peng, D., Dong, J., **Jian, J.**, Peng, Q., Zeng, B., & Mao, Z. H. (2018, August). Economic-driven FDI attack in electricity market. In *International Conference on Science of Cyber Security* (pp. 216-224). Springer, Cham.

Conference presentations

- Jian, J. (2021, May 25-28). *Multi-Objective Optimization Approach to Pure Strategy Equilibria in Games with Imperfect Information*. 2021 American Control Conference (ACC), IEEE. New Orleans, LA.
- Jian, J. (2022, October 4-5). *Stimulation of Sacral S1/S2 Spinal Nerve Roots for Restoration of Male Sexual Function after Spinal Cord Injury*. DARPA Forward. The Ohio State University, OH.