Bole (James) Pan

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EDUCATION

Massachusetts Institute of Technology, Harvard-MIT Health Sciences and Technology Expected May 2029
Doctor of Philosophy, Medical Engineering and Medical Physics

Columbia University in the City of New York, Columbia College Sept. 2020 – May 2024
Bachelor of Arts, Computer Science
GPA: 4.08; *Summa cum Laude*, Phi Beta Kappa

Relevant Coursework: Machine Learning, Real Analysis, Probability Theory, Statistical Inference, Stochastic Systems, Ordinary Differential Equations, Dynamical Systems, Linear Algebra, Geometric Data Analysis, Analysis of Algorithms, Systems Programming in C, Introductory Biology, Intensive Organic Chemistry

GRANTS AND AWARDS

1. Departmental Computer Science Scholarship Award (2024)
2. Rhodes Scholarship Finalist (2023)
3. Upsilon Pi Epsilon (UPE) International Computer Science Honor Society Inductee (2023)
4. Robert K. Kraft Global Fellowship (2022)
5. Ng Teng Fong Internship Award (2021)

RESEARCH EXPERIENCE

Max Planck Institute for Biology of Ageing
Undergraduate Researcher; Advisor: Prof. Ron Jachimowicz May 2024 – Present

- Developing analysis pipelines for whole exome and transcriptomic sequencing data of relapsed/refractory mantle cell lymphoma patients, aiming to identify genetic variations linked to treatment responses.

Memorial Sloan Kettering Cancer Center, Computational and Systems Biology Program
Undergraduate Researcher; Advisor: Prof. Dana Pe'er Sept. 2023 – May 2024

- Modeling chromatin structural changes with single-cell ATAC-seq data. Employed geometric data analysis and statistical inference to reveal nucleosome kinetics during prostate cancer neuroendocrine transformation (link).

Columbia University, Zuckerman Institute Center for Theoretical Neuroscience
Computational Neuroscience Research Assistant; Advisor: Prof. Liam Paninski Sept. 2022 – Aug. 2023

- Proposed and implemented a permutation-invariant neural network based on PointNet architecture to process mouse electrophysiology data. Achieved performances on par with state-of-the-art decoding methods (link).

Columbia University, Department of Biological Sciences
Computational Neuroethology Research Fellow; Advisor: Prof. Darcy Kelley May 2022 – Jan. 2023

- Investigated the evolution of vocal communication in African clawed frogs, *Xenopus.* Developed computational pipelines for speech identification using digital signaling and stochastic processes (link).

INDUSTRY EXPERIENCE

Amazon, Inc. (AWS Timestream team)
Software Development Engineer (SDE) Intern; Manager: Audrey Lawrence June – August 2023

- Designed and built distributed caches for user authentication across Timestream's data ingestion routers. Leveraged Amazon Elasticache and Key Management Services (KMS). Aimed to decrease auth server calls by 100-fold and reduce latency. Secured full-time return offer.

PUBLICATIONS

1. **Pan, B**., Kwon, Y., Bagnato-Colin, E., Kelley, D. (2023). Ethology and evolution of courtship vocalization in Xenopus. *Society for Integrative and Comparative Biology (SICB) Annual Meeting 2023*. (Abstract)
2. Xue, Y., Yang, F., Li, J., Zuo, X., **Pan, B.**, Li, M., Quinto, L., Mehta, J., Stiefel, L., Kimmey, C., Eshed, Y., Zussman, E., Simon, M., & Rafailovich, M. (2021). Synthesis of an effective flame-retardant hydrogel for skin protection using xanthan gum and resorcinol bis(diphenyl phosphate)-coated starch. *Biomacromolecules*, *22*(11), 4535–4543. https://doi.org/10.1021/acs.biomac.1c00804
3. **Pan, B.**, Wang, Y., Li, H., Yi, W., & Pan, Y. (2020). Preparation and electrosorption desalination performance of peanut shell-based activated carbon and MOS_2. *International Journal of Electrochemical Science*, *15*, 1861–1880. https://doi.org/10.20964/2019.12.74
4. Islam, D., Uddin, M. H., **Pan, B.**, & Joy, M. M. A. (2020). Flexible and high-energy dense yarn-shaped supercapacitor based on Ni-carbon nanotubes framework. *Chemical Physics Letters*, *760*, 138007. https://doi.org/10.1016/j.cplett.2020.138007
5. Xiao, X., Lin, Y., **Pan, B**., Fan, W., & Huang, Y. (2018). Photocatalytic degradation of methyl orange by $BiOI/Bi_4O_5I_2$ microspheres under visible light irradiation. *Inorganic Chemistry Communications*, *93*, 65–68. https://doi.org/10.1016/j.inoche.2018.05.009

MEETINGS AND PRESENTATIONS

1. Society for Integrative and Comparative Biology (SICB) Meeting, Austin, TX, January 2023. (Poster)
2. Shanghai Science Festival 2021, Shanghai, China, May 2021. (One of four Teen Innovators invited)
3. Sigma Xi 2020 Annual Meeting & Student Research Conference, Online, November 2020. (Oral)
4. American Chemical Society (ACS) Spring 2020 Meeting, Philadelphia, PA, March 2020. (Poster)
5. Materials Research Society (MRS) Fall 2019 Meeting, Boston, MA, December 2019. (Poster)

LEADERSHIP/SERVICE

Columbia College Student Council. *Class of 2024 Representative* Oct. 2022 – May 2024

- Elected by peers to represent the class. Spearheaded university-wide events including 'After Hour at Luna Park' and 'Explore NYC Initiative for CC' engaging 2000+ students. Actively contributed to constitutional reform and student wellbeing policy recommendations

Columbia University Systems Biology Initiative. *Vice President, Project Lead* Nov. 2021 – May 2024

- Oversaw event promotions and finances. Organized visits to biotech startup incubators. Produced podcast series Bio Bytes and BioWorks to communicate systems biology to public.

Sophie Gerson Healthy Youth Foundation. *Space Science/Astronomy Counselor* Sept. 2021 – May 2024

- Led regular space science sessions for middle school students in underprivileged communities in NYC. Taught skills including telescope viewing, stargazing, drone operating, and basketball.

OTHERS

Languages: Mandarin (Native), English (Bilingual), Cantonese (Conversational)

Computer Programming: Java, Python, C, Julia, LaTeX, Arduino IDE, Bash, GitHub

Interests: Basketball (Columbia Intramural D3 Second Place, Spring 2022), Cycling (Orlando -> Key West, 753 km, May 2022), Writing (Medium page)