Bole (James) Pan

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EDUCATION

Columbia University, Columbia College, New York, NY
Bachelor of Arts, Computer Science, concentration in Mathematics — Sep. 2020 – May 2024
GPA: 4.11; Dean's List (all semesters)

Guangzhou Tianhe Foreign Language School, Guangzhou, China.
High School Degree. Ranking: 1/199. — Sep. 2017 – May 2020

RESEARCH EXPERIENCE

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

- Modeling chromatin structural change with single-cell ATAC-seq data. Working on capturing nucleosome shifts through foot-printing to identify global patterns throughout development and disease states.

Columbia University, Zuckerman Institute Center for Theoretical Neuroscience
Undergraduate Researcher; Advisor: Prof. Liam Paninski — Sep. 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 — Oct. 2021 – 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).

Stony Brook University, Department of Materials Science and Chemical Engineering
Garcia Research Scholar; Advisor: Prof. Miriam Rafailovich — Jun. 2019 – Aug. 2020

- Developed a flame-retardant hydrogel to protect firefighters from burns. Devised quantitative models to understand heat diffusion mechanisms. Presented at Stony Brook Fire Dept. and Israel Chemicals Ltd.

INDUSTRY EXPERIENCE

Amazon, Inc. (AWS Timestream team)
Software Development Engineer (SDE) Intern; Manager: Audrey Lawrence — Jun. – Aug. 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

GRANTS AND AWARDS

1. Rhodes Scholarship Finalist (2023)
2. Upsilon Pi Epsilon (UPE) International Computer Science Honor Society Inductee (2023)
3. Robert K. Kraft Global Fellowship (2022)
4. Columbia Mathematical Modeling Contest Second Place (2022)
5. Regeneron International Science and Engineering Fair (ISEF) Finalist (2020)
6. Stockholm Junior Water Prize Finalist (2019)
7. S. -T. Yau High School Science Award (Chemistry) Global Top 10 (2019)

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. Shanghai International Youth Science and Technology Expo, Online, August 2020. (Best Poster Award)
5. American Chemical Society (ACS) Spring 2020 Meeting, Philadelphia, PA, March 2020. (Poster)
6. Materials Research Society (MRS) Fall 2019 Meeting, Boston, MA, December 2019. (Poster)

LEADERSHIP/SERVICE

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

- 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 – Present

- 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* Sep. 2021 – Present

- Led regular space science sessions for middle school students in underprivileged communities in NYC. Designed and delivered interactive curriculums. Taught skills including telescope viewing, stargazing, drone operating, and basketball. Volunteered both during the academic year and the summer.

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)