Wesley Wei Qian

DrQ.ai

Education

University of Illinois Urbana Champaign 2017 - 2022

Doctor of Philosophy in **Computer Science**

Dissertation: **Machine learning for drug discovery and beyond** (*advisor: Jian Peng*)

GPA: **4.00** / 4.00

Awards: **University Fellowship, Richard T. Cheng Endowed Fellowship**

Brandeis University 2013 - 2017

Bachelor of Science in **Computer Science** and **Neuroscience**

Senior Thesis: **Graph matching, pattern learning, and protein modeling** (*advisor: Pengyu Hong*)

GPA: **3.96** / 4.00 (Overall) **4.00** / 4.00 (CS)

Awards: **Summa Cum Laude, Phi Beta Kappa (Junior), Schiff Fellowship, Collaborative Research Grant**

Experience

Head of Machine Leaning (Founding Team) | Osmo Sep 2022 - Present

- Spinning out of Google, we start Osmo to give computers a sense of smell.✨

Student Researcher | Google May 2018 - Sep 2022

- I spent part of my Ph.D. working with the talented folks from Google Brain and Accelerated Science.
- Between 2020 to 2022, I worked on receptor binding, transfer learning, and metabolic activity related to odorant molecules with a team focusing on digitizing smell. I led/participated in one utility patent and four publications highlighted in various news outlets. Our team's discovery eventually led to the spinout of Osmo, backed by Google Venture, Lux Capital, and other investors with $60M.
- In 2019, I proposed a combinatorial formulation for structural variant calling through ML-based filtering and perturbation to improve the precision of existing callers. An efficient (x100) algorithm is also developed to align reads to various genome construction and filed as a utility patent.
- In 2018, I leveraged the Generative Adversarial Network (GAN) and created a generative model to mediate the batch effect in high-content cell imaging. The model implementations are contributed to the TF-GAN library, and the work is later published in the Bioinformatics journal.

Intern | DeepMind Sep 2021 - Dec 2021

- I worked with folks in the AlphaFold team on protein-related projects.
- The tech stack of the projects involves JAX and different areas of the AlphaFold2 codebase.

Software Engineering Intern | Uber Summer 2016 & 2017

- In 2017, I developed a variant of conditional random fields to infer key events during Uber Eats delivery with a mobile sensor. I also identified data quality issues causing performance degradation in the prior effort. The project won the first prize for Uber's internal machine learning poster session.
- In 2016, I designed and created a web application for internal mobile developers to investigate UI test failures that synchronize the test logs and video timestamps to reduce the debug time by 50%.

Publication (*equal contribution)

- **A Principal Odor Map Unifies Diverse Tasks in Human Olfactory Perception**
  Science (2023)
  - Brian K. Lee*, Emily E Mayhew*, Benjamin Sanchez-Lengeling, Jennifer N. Wei, **Wesley W. Qian**, Kelsie Little, Matthew Andres, Britney B. Nguyen, Theresa Moloy, Jacob Yasonik, Jane K. Parker, Richard C. Gerkin, Joel D. Mainland, Alexander B. Wiltschko
- **Metabolic activity organizes olfactory representations**
  eLife (2023)
  - **Wesley W. Qian**, Jennifer N. Wei, Benjamin Sanchez-Lengeling, Brian K. Lee, Yunan Luo, Marnix Vlot, Koen Dechering, Jian Peng, Richard C. Gerkin, Alexander B. Wiltschko
- **3D Equivariant Diffusion for Target-Aware Molecule Generation and Affinity Prediction**
  ICLR (2023)
  - Jiaqi Guan*, **Wesley W. Qian***, Xingang Peng, Yufeng Su, Jian Peng, Jianzhu Ma
- **A central chaperone-like role for 14-3-3 proteins in human cells**
  Molecular Cell (2023)
  - Dmitri Segal, Stefan Maier, Giovanni J Mastromarco, **Wesley W. Qian**, Syed Nabeel-Shah, Hyunmin Lee, Gaelen Moore, Jessica Lacoste, Brett Larsen, Zhen-Yuan Lin, Abeeshan Selvabaskaran, Karen Liu, Craig Smibert, Zhaolei Zhang, Jack Greenblatt, Jian Peng, Hyun O Lee, Anne-Claude Gingras, Mikko Taipale
- **Pervasive mislocalization of pathogenic coding variants underlying human disorders**
  Under Review (2023)
  - Jessica Lacoste, Marzieh Haghighi, Shahan Haider, Zhen-Yuan Lin, Dmitri Segal, Chloe Reno, **Wesley W. Qian**, Xueting Xiong, Hamdah Shafqat-Abbasi, Pearl V Ryder, Rebecca Senft, Beth A Cimini, Frederick P Roth, Michael Calderwood, David Hill, Marc Vidal, S Stephen Yi, Nidhi Sahni, Jian Peng, Anne-Claude Gingras, Shantanu Singh, Anne E Carpenter, Mikko Taipale
- **A deep learning and digital archaeology approach for mosquito repellent discovery**
  Under Review (2022)
  - Jennifer N. Wei*, Marnix Vlot*, Benjamin Sanchez-Lengeling, Brian K. Lee, Luuk Berning, Martijn W. Vos, Rob W.M. Henderson, **Wesley W. Qian**, D. Michael Ando, Kurt M. Groetsch, Richard C. Gerkin, Alexander B. Wiltschko, Koen J. Dechering
- **Energy-Inspired Molecular Conformation Optimization**
  ICLR (2022)
  - Jiaqi Guan*, **Wesley W. Qian***, Qiang Liu, Wei-Ying Ma, Jianzhu Ma, Jian Peng
- **Integrating Deep Neural Networks and Symbolic Inference for Organic Reactivity Prediction**
  ACS National Meeting (2021)
  - **Wesley W. Qian***, Nathan T. Russell*, Claire L. W. Simons, Yunan Luo, Martin D. Burke, Jian Peng

- **ECNet is an evolutionary context-integrated deep learning framework for protein engineering**
  Nature Communication (2021)
  - Yunan Luo, Guangde Jiang, Tianhao Yu, Yang Liu, Lam Vo, Hantian Ding, Yufeng Su, **Wesley W. Qian**, Huimin Zhao, Jian Peng
- **Comprehensive interactome profiling of the human Hsp70 network highlights functional differentiation of J domains**
  Molecular Cell (2021)
  - Benjamin L. Piette, Nader Alerasool, Zhen-Yuan Lin, Jessica Lacoste, Mandy Hiu Yi Lam, **Wesley W. Qian**, Stephanie Tran, Brett Larsen, Eric Campos, Jian Peng, Anne-Claude Gingras, Mikko Taipale
- **Batch Equalization with a Generative Adversarial Network**
  Bioinformatics (2020)
  - **Wesley W. Qian**, Cassandra Xia, Subhashini Venugopalan, Arunachalam Narayanaswamy, Michelle Dimon, George W. Ashdown, Jake Baum, Jian Peng, D Michael Ando
- **Evaluating Attribution for Graph Neural Networks**
  NeurIPS (2020)
  - Benjamin Sanchez-Lengeling, Jennifer Wei, Brian Lee, Emily Reif, Peter Wang, **Wesley W. Qian**, Kevin McCloskey, Lucy Colwell, Alexander B. Wiltschko
- **Evolutionary context-integrated deep sequence modeling for protein engineering**
  RECOMB (2020)
  - Yunan Luo, Lam Vo, Hantian Ding, Yufeng Su, Yang Liu, **Wesley W. Qian**, Huimin Zhao, Jian Peng

Services

- **Program Committee** for ICML - ML Interpretability for Scientific Discovery Workshop 2020
- **Reviewer** for ICML (2024), ICLR (2024), NeurIPS (2023), LoG (2022 & 2023), RECOMB (2021), ISMB (2019 & 2020)