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

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)

- **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
- **A Principal Odor Map Unifies Diverse Tasks in Human Olfactory Perception**
  Under Review (2022)
  - Brian K. Lee*, Emily E Mayhew*, Benjamin Sanchez-Lengeling, Jennifer N. Wei, **Wesley W. Qian**, Kelsie Little, Matthew Andres, Britney B. Nguyen, Theresa Moloy, Jane K. Parker, Richard C. Gerkin, Joel D. Mainland, Alexander B. Wiltschko
- **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

- **Reviewer** for Learning on Graph Conference 2022
- **Reviewer** for International Conference on Research in Comp. Molecular Biology (RECOMB) 2021
- **Program Committee** for ICML - ML Interpretability for Scientific Discovery Workshop 2020
- **Reviewer** for Intelligent Systems for Molecular Biology (ISMB) 2019 & 2020