



## 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 build the operating system for scent. ✨

### 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%.

## 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.

## Publication (\*equal contribution)

- ▶ Metabolic activity organizes olfactory representations.  
*Under Review* (2022).
  - **Wesley W. Qian**, Jennifer N. Wei, Benjamin Sanchez-Lengeling, Brian K. Lee, Yunan Luo, Marnix Vlot, Koen Decherer, Jian Peng, Richard C. Gerkin, Alexander B. Wiltschko
- ▶ 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. Decherer
- ▶ 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
- ▶ Energy-Inspired Molecular Conformation Optimization.  
*ICLR* (2022).
  - Jiaqi Guan\*, **Wesley W. Qian\***, Qiang Liu, Wei-Ying Ma, Jianzhu Ma, 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
- ▶ 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
- ▶ 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