Wesley Wei Qian

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DrQ.ai

Experience

Director of Applied Research (Founding Team) | Osmo   Sep 2022 - Present

▸ Started as the first research engineer, I built and led applied research with 10+ person (algorithms + human data), scaling AI for olfactory from prototypes to shipped product lines and revenue.

▸ [2025] Drove multi millions contract and multi-year strategic partnership with a major CPG company by leading a team to demo a suite of AI-based solutions for fragrance optimization and formulation.

▸ [2024] Fine-tuned an LLM for fragrance formulation based on odor profile, cost, and application; combined SFT with RLHF using in-house perfumery tools to align outputs with expert preferences.

▸ [2024] Prototyped an agentic RAG system that converts multi-modal briefs into physical fragrance samples; evolved into our main product - Osmo Studio with >$100k in sales within 3 months [blog].

▸ [2023] Led end-to-end development of an odor-intensity model (lab automation → labeling pipeline → model training/eval → deployment); when combined with my work done in 2022, increased our ingredient discovery speed by 4x, resulting in a collaboration with industry leading fragrance house.

▸ [2022] Migrated ML stack from Google-internal codebase to PyTorch on GCP with Weights & Biases; rewrote GNN codebase and productionized training and inference workflows.

Student Researcher | Google   May 2018 - Sep 2022 (half time during PhD)

▸ [2020-2022] Advanced olfaction ML (receptor binding, transfer learning, metabolic activity) resulting in one utility patent and four publications highlighted in various news outlets; work catalyzed **Osmo**'s spin-out backed by Google Venture, Lux Capital, and others with ~$60M raised.

▸ [2019] Proposed a a combinatorial formulation for structural variant calling with ML-based filtering/ perturbation; built a ~100× faster read-alignment approach across genome; filed as a utility patent.

▸ [2018] Developed a Generative Adversarial Network (GAN) to mitigate batch effects in high-content cell imaging; contributed implementations to TF-GAN library; published in *Bioinformatics*.

Intern | DeepMind   Sep 2021 - Dec 2021

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

Software Engineering Intern | Uber   Summer 2016 & 2017

▸ [2017] Built a conditional random fields variant to infer key events in Uber Eats deliveries from mobile sensors; identified upstream data-quality issues degrading earlier efforts; won 1st prize at Uber's internal ML poster session.

▸ [2016] Created a web app for mobile UI-test forensics that syncs logs with video timestamps, cutting debug time ~50% for internal devs.

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

Brandeis University   2013 - 2017

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

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

# Publication (*equal contribution)

▸ **Smells of New York: A Multimodal Dataset for In-the-Wild Olfaction**
Under Review (2025) | Website

- Ege Ozguroglu, Junbang Liang, Ruoshi Liu, Mia Chiquier, Michael DeTienne, **Wesley W. Qian**, Alexandra Horowitz, Andrew Owens, Carl Vondrick

▸ **A deep learning and digital archaeology approach for mosquito repellent discovery**
Chemical Science (2025) | Paper

- Jennifer N. Wei*, Carlos Ruiz*, Marnix Vlot*, Benjamin Sanchez-Lengeling, Brian K. Lee, Luuk Berning, Martijn W. Vos, Rob WM Henderson, **Wesley W. Qian**, Jacob N. Sanders, D. Michael Ando, Kurt M. Groetsch, Richard C. Gerkin, Alexander B. Wiltschko, Jeffrey A. Riffell, Koen J. Dechering

▸ **Pervasive mislocalization of pathogenic coding variants underlying human disorders**
Cell (2024) | Paper

- Jessica Lacoste, Marzieh Haghighi, Shahan Haider, Chloe Reno, Zhen-Yuan Lin, Dmitri Segal, **Wesley W. Qian**, Xueting Xiong, Tanisha Teelucksingh, Esteban Miglietta, Hamdah Shafqat-Abbasi, Pearl V. Ryder, Rebecca Senft, Beth A. Cimini, Ryan R. Murray, Chantal Nyirakanani, Tong Hao, Gregory G. McClain, Frederick P. Roth, Michael A. Calderwood, David E. Hill, Marc Vidal, S Stephen Yi, Nidhi Sahni, Jian Peng, Anne-Claude Gingras, Shantanu Singh, Anne E. Carpenter, Mikko Taipale

▸ **A Principal Odor Map Unifies Diverse Tasks in Human Olfactory Perception**
Science (2023) | Paper - Scientific American - Quanta Magazine

- 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) | Paper - aeon

- **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) | Paper

- 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) | Paper

- 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

▸ **Energy-Inspired Molecular Conformation Optimization**
ICLR (2022) | Paper

- 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) | Paper
  - **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) | Paper
  - 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) | Paper
  - 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) | Paper
  - **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) | Paper
  - 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) | Paper
  - 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 Nature Machine Intelligence (2025), ICML (2024), ICLR (2024), NeurIPS (2023), LoG (2022 & 2023), RECOMB (2021), ISMB (2019 & 2020)