Candice Lee, PhD

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Neuroscientist with 9+ years of experience in large-scale functional brain imaging, neural decoding, and machinelearning. Strong track record of leading scientific projects from conception to publication.

EDUCATION

University of Ottawa — *Ottawa, Canada*

Doctor of Philosophy (PhD) in Neuroscience — *2016–2022*

› **Thesis:** "Cell-type specific responses to reinforcement in the primary motor cortex"

Bachelor of Science (BSc) with Honours in Biomedical Sciences — *2012–2016*

› **Thesis:** "Neural Correlates of Spatial Navigation"

EXPERIENCE

University of Oxford — *Oxford, UK*

Postdoctoral Research Scientist — *Feb 2023–Oct 2025*

› Built an in vivo two-photon calcium imaging facility and designed closed-loop behavioral systems in *C++* to investigate neural encoding of texture in behaving mice.

› Developed ML pipelines in *Python* for imaging data, including image segmentation, feature extraction (CNMF), and unsupervised quality control benchmarks (k-means) — adopted lab-wide.

› Applied signal processing and ML classifiers (CNN, SVM, GLM) to decode textures from neural activity.

› Collaborated with an engineering team to pioneer adaptive optics for next-generation deep-tissue imaging.

› Mentored researchers at multiple levels on experimental, imaging, and computational methodologies.

› *Supervised by Prof. Randy Bruno.*

University of Ottawa — *Ottawa, Canada*

PhD in Neuroscience — *Sep 2016–Nov 2022*

› Used in vivo calcium imaging and statistical inference to discover cell-type specific encodings of reward among four distinct neuron populations in the motor cortex of behaving mice.

› Mapped whole-brain inputs to distinct cell types using monosynaptic rabies tracing and automated image segmentation and cell counting, revealing novel long-range connectivity patterns.

› Developed multimodal analysis pipelines in *MATLAB* integrating behavioral tracking and calcium imaging data.

› *Supervised by Prof. Simon Chen.*

Undergraduate Research Assistant — *Apr 2015–Sep 2016*

› Engineered a novel wireless, waterproof multi-electrode system for chronic brain recordings synchronized with electric sense recordings in freely swimming fish during naturalistic behavior.

› *Supervised by Prof. Len Maler.*

KEY SKILLS

Scientific AI & Machine Learning: Python (PyTorch, scikit-learn, pandas, NumPy, SciPy, Matplotlib); signal processing and time-series analysis; large-scale neural imaging datasets; image segmentation and feature extraction (CaImAn/CNMF); ML for classification and decoding (CNN, SVM, GLM); statistical inference (Monte Carlo, permutation testing); MATLAB; Git.

Research & Domain Expertise: Neuroscience and biological imaging; two- and three-photon microscopy; chronic electrode recordings; experimental design and hypothesis-driven research; evaluating technical scientific project proposals, papers, and cutting-edge methodologies; integrating diverse biological data sources.

Scientific Leadership & Communication: Founding member of two research labs — built infrastructure, protocols, and workflows from scratch; designed SOPs to ensure regulatory compliance; led cross-functional initiatives from conception to publication; organized and chaired scientific conferences; elected president of graduate student association; taught and mentored 10+ researchers; translating complex technical concepts to non-specialist audiences.

PUBLICATIONS

Whole-brain mapping of long-range inputs to the VIP-expressing inhibitory neurons in the primary motor cortex
Candice Lee*, Sandrine Côté*, Nima Raman, Hritvic Chaudhary, Bryan Mercado, Simon X. Chen (* equal contribution)
Frontiers in Neural Circuits, 2023.

Cell-type-specific responses to associative learning in the primary motor cortex
Candice Lee, Emerson Harkin, Xuming Yin, Richard Naud, Simon X. Chen
eLife, 2022. - **Received the CIHR Brain Star Award, recognizing excellence in Canadian research.**

Light Up the Brain: The Application of Optogenetics in Cell-Type Specific Dissection of Mouse Brain Circuits
Candice Lee, Andreanne Lavoie, Jiashu Liu, Simon X. Chen, Bao-hua Liu
Frontiers in Neural Circuits, 2020.

Neural activity in a hippocampus-like region of the teleost pallium is associated with active sensing and navigation
Haleh Fotowat, **Candice Lee**, James Jaeyoon Jun, Len Maler
eLife, 2019.

FELLOWSHIPS & SCHOLARSHIPS

- **Natural Sciences and Engineering Research Council of Canada Postdoctoral Fellowship.** 2023–2025
- **Ontario Graduate Scholarship.** 2018–2019, 2020–2021, 2021–2022
- **Queen Elizabeth II Graduate Scholarship in Science and Technology.** 2017–2018, 2019–2020
- **University of Ottawa Excellence Scholarship.** 2017–2021
- **Undergraduate Admission Scholarship.** 2012

ACADEMIC ACHIEVEMENTS & AWARDS

- **Award of Excellence.** For exceptional performance and commitment. University of Oxford. 2024
- **Brain Star Award.** National paper award. Canadian Institutes of Health Research. 2023
- **Best Doctoral Thesis in Neuroscience Award.** University of Ottawa. 2022
- **Neuroscience Doctoral Award.** For excellent research performance. University of Ottawa. 2022
- **FENS-IBRO/PERC Travel Award.** International competition to fund travel to FENS conference. Paris. 2022
- **Best Doctoral Poster Presentation.** uOttawa and Brain Health Research Day Conferences. 2019, 2021, 2022
- **Leadership Award.** In recognition of role on graduate student association. University of Ottawa. 2018
- **Dean's Honour List.** University of Ottawa. 2016

TEACHING

University of Ottawa *Ottawa, Canada*

Coordinator/Instructor for Undergraduate Summer Student Research Program *Apr 2019–Apr 2020*

- Led an interdisciplinary course on scientific communication, mentoring students on how to distill complex methods and findings into accessible and engaging narratives.

SCIENTIFIC REVIEW

- **External Reviewer for NSERC.** 2024–present
  Evaluated 50+ national-level fellowship and scholarship applications, for scientific rigor, feasibility and data interpretation.

COMMITTEES

- **President, Graduate Student Association.** University of Ottawa. 2019–2020
  Led exec team; launched mental health & academic initiatives; liaised between students & faculty/admin
- **Academic Coordinator, Graduate Student Association.** University of Ottawa. 2018–2019
  Coordinated academic support for graduate students; launched *Python 101*.
- **Conference Organizer & Chair.** University of Ottawa. 2018–2019
  Organized and chaired institutional and multi-institutional regional conferences.