

## PANKAJ K. GUPTA

Cell: +1 (604) 715 7045 — Email: [pankajgupta@alumni.ubc.ca](mailto:pankajgupta@alumni.ubc.ca) — <https://pankajgupta.github.io/>**Education**

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**PhD in Neuroscience**

University of British Columbia, Vancouver, Canada.

*Sep. 2018 - Oct. 2025**Dissertation:* Shaping cortical and behavioral motor dynamics using real-time closed-loop feedback system

Advisor: Prof. Timothy H. Murphy

**M.Sc. Interactive Entertainment Tech. (CS)**

Trinity College Dublin, Ireland

*Aug. 2011 - Jul. 2012***B.E. Computer Engineering**

University of Pune, Pune, India

*Aug. 2004 - Jul. 2008***Research and Work Experience**

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**Postdoctoral Researcher**

Stanford University (Dr. Spyridon Karadimas), California, USA

*Dec. 2025*

- Collaborating with Dr. Karadimas (PI at Stanford) and Dr. Azim (Salk Inst.) on cortical - spinal cord interactions during motor learning in the context of Stroke recovery.

**PhD Researcher**

University of British Columbia, Vancouver, Canada

*Sep. 2018 - Jul. 2025*

- Designed and implemented a closed-loop feedback systems to study cortical dynamics in motor learning tasks in mice.
- Developed computational models (RNNs, HMMs) to analyze neural data and identify learning-related activity patterns.
- Collaborating on computational modeling of Allen Institute dataset with Dr. Adrienne Fairhall Lab.

**Research Associate**

Brown University, Providence, RI, USA

*Oct. 2015 - Jun. 2018*

- Using computational analysis of behavior to discover developmental change in memory-guided attention mechanisms in a smart-playroom

**Research Engineer**

ATR International, Kyoto, Japan

*Dec. 2012 - Jul. 2015*

- Decoding physical actions using Near-infrared spectroscopy signals from the brain in an assisted smart-house for disabled people

**Intern (M.Sc. Thesis)**

ATR International, Kyoto, Japan

*May 2012 - July 2012*

- Thesis: Estimating a person's object of interest in a smart-house using depth sensors

**Sr. Software Developer**

Propalms Network Pvt. Ltd., Pune, India

*Dec. 2008 - Aug. 2011*

- Worked on a novel virtual private network (VPN) and desktop infrastructure (VDI)

**Associate Software Developer**

GlobalLogic, Noida, India

*Aug. 2008 - Dec. 2008***Teaching and Mentorship**

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**Programming Tutor (Python, MATLAB)**

Dynamic Brain Circuits cluster, University of British Columbia, Vancouver, Canada

*Mar. 2020 - Dec. 2023*

Mentored graduate students on programming techniques and data analysis in their project.

**Teaching Assistant**

Assisted in teaching systems neuroscience and computational modeling topics.

- UBC Neuroscience NRSC-500(2022F) course Sep. 2022 - Dec. 2022
- Summer Workshop on the Dynamic Brain (2022), Friday Harbor, USA Aug. 2022 - Sep. 2022
- Lead Teaching Assistant - UBC Neuroscience NRSC-501(2021W) course Dec. 2020 - May 2021
- NeuroMatchAcademy (2020, and 2021) Summer School, held online Aug. 2021, July 2020
- Frontiers in Neurophotonics Summer School, Quebec City, Canada June 2019

## Summer Courses

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<a href="#">Summer Workshop on the Dynamic Brain (Allen Institute; U. Wash., USA)</a>	Aug 2021
<a href="#">CNEURO 2020: Theoretical and Computational Neuroscience (Tsinghua University, China)</a>	Aug 2020
<a href="#">Methods in Neuroscience at Dartmouth (Dartmouth College, USA)</a>	Jul - Aug 2018
<a href="#">Translational Neuroscience and Neural Engineering (Brown Uni. &amp; EPFL)</a>	June 2018
<a href="#">Computational Approaches to Memory and Plasticity (NCBS, Bangaluru, India)</a>	Jul - Aug 2017

## Technical Skills

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- **Programming Languages:** Python, MATLAB, C#, C++, C
- **Data Analysis & Modeling:** Tensor decomposition, RNNs, HMMs, PCA, t-SNE, UMAP, clustering, statistical analysis, signal processing, supervised and unsupervised machine learning, Computer Vision, Augmented Reality
- **Neuroimaging Techniques:** Widefield, and Two-photon imaging, optogenetics, electroencephalogram (EEG), near infrared spectroscopy (NIRS)
- **Software & Tools:** Conda, VS Code, GitHub, OpenCV, OpenGL, SciPy, NumPy, Inkscape

## Publications

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- Gupta, P.**, Murphy, T. (2024) “*Real-Time Closed-Loop Feedback System For Mouse Mesoscale Cortical Signal And Movement Control: CLoPy*” *eLife* 14:RP105070
- T Fong, H Hu, **P Gupta**, B Jury, TH Murphy (2023) “*PyMouseTracks: flexible computer vision and RFID-based system for multiple mouse tracking and behavioral assessment*” *eneuro* 10 (5)
- Bolaños, L. A., ..., **Gupta, P. K.**, ..., Murphy, T. H. (2021). “*A three-dimensional virtual mouse generates synthetic training data for behavioral analysis*” *Nature Methods*, 18(4), 378–381
- Gupta, P.**, Murphy, T. (2021) “*Real-time neural feedback of mesoscale cortical GCAMP6 signals for training mice*” *Computational and Systems Neuroscience (Cosyne) 2021*, 2-118
- Hart et. al. (2021) “*Neuromatch Academy: a 3-week, online summer school in computational neuroscience*” *Journal of Open Source Education*
- Amso, D., ..., **Gupta, P.**, ... Serre, T. (2021) “*Using Computational Analysis of Behavior To Discover Developmental Change In Memory-Guided Attention Mechanisms In Childhood*”
- Freier, L., **Gupta, P.**, Badre, D., Amso, D. (2020) “*The value of choice in 3- to 7-year-olds’ use of working memory gating strategies in a naturalistic task*” *Developmental Science (DS-05-19-0224-P)*
- Forys, B. J., Xiao, D., **Gupta, P.**, Murphy, T. H. (2020). “*Real-time selective markerless tracking of forepaws of head fixed mice using deep neural networks*” *Eneuro*, ENEURO.0096-20.2020
- Gupta, P.K.**, and Murphy, T.H. (2019). “*Cortex-wide Computations in Complex Decision Making in Mice*” *Neuron* 104, 631–633
- Drew Linsley, Sven Eberhardt, Tarun Sharma, **Pankaj Gupta**, Thomas Serre “*What are the visual features underlying human versus machine vision?*” *Proceedings of the IEEE CVPR 2017*, 2706-2714
- Abdur-Rahim, J., Morales, Y., **Gupta, P.**, Umata, I., Watanabe, A., Even, J., ... Ishii, S. (2016). “*Multi-sensor based state prediction for personal mobility vehicles*” *PLoS ONE*, 11(10)

Ogawa, T., Hirayama, J. I., **Gupta, P.**, Moriya, H., Yamaguchi, S., Ishikawa, A., ... Ishii, S. (2015). "Brain-machine interfaces for assistive smart homes: A feasibility study with wearable near-infrared spectroscopy" *Proc. of the IEEE EMBS*, 1107-1110

Ogawa T, **Gupta KP**, Yano K, Abdur-Rahim JA, Morioka H, Hirayama J, Yamaguchi S, Ishikawa A, Inoue Y, Kawanabe M, Ishii S. "Decoding daily behaviors from NIRS signatures by using a portable NIRS device in the daily-life environment" *Society for Neuroscience 2014*, Washington DC, USA, November 2014

Ogawa T, **Gupta KP**, Yano K, Abdur-Rahim JA, Morioka H, Hirayama J, Yamaguchi S, Ishikawa A, Inoue Y, Kawanabe M, Ishii S. "Decoding daily-life behavioral signatures in the real environment: portable NIRS signal using behavior labels" *37th Japan Neuroscience Society*, Yokohama, Japan, September 2014

## Selected Presentations

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"Real-time feedback of cortical activity and specific body movements in mice"

*NeuroAI-Seattle 2024 (Talk)*

"Platform for real-time closed-loop feedback of behavior and cortical GCaMP activity in mice" *Nanosymposium, Society for Neuroscience 2023 (Talk)*

"Modeling multi-region cortical interactions using task-specific data-constrained recurrent neural networks" *Lake Conference 2023 (Poster)*

"Introduction to DeepLabCut" *Precision Health Bootcamp 2022, UBC (Talk)*

"Real-time neural feedback of mesoscale cortical GCaMP6 signals for training mice" *Computational and Systems Neuroscience (Cosyne) 2021 (Poster)*

"What classic neuroscience result would you revisit with a BMI?" *Annual Symposium 2019, SWC, UCL (Talk)*

## Awards and Honors

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- [CPSR](#) 180 Pitch Competition, second place
- [LLMs for Brain Health 2023](#) hackathon winner
- [AccelNet IN-BIC](#) fellowship 2021, 2022
- [CCN 2022](#) conference award (Simons Foundation)
- [Frontiers in Neurophotonics 2021](#) presentation winner
- Student choice award for project at [SWDB 2021](#)
- [Brain-Tech 2021](#) hackathon winner
- [DMCBH Neural Repair Endowment](#) 2021
- [Edward Squires Memorial Fellowship](#) 2020
- [MIT GrandHack2016](#) healthcare at home award
- [SAMSUNG BADA](#) codeathon 2011 winner

## Community Engagement

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- Co-chair, [Canadian Partnership for Stroke Recovery \(CPSR\) National Trainee Association](#)
- Member, [Diversity Mentorship Program](#), UBC
- Editor and Communications Manager at [Neuropsyched.ca](#), a UBC-student run science magazine
- Science communicator at the [Science World](#), Vancouver
- Added support for non-Admin users of [OpenVPN](#) client on Windows platform