

Brandon Forys

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Education

BA Honours in Psychology, the University of British Columbia, Vancouver, BC, May 2020

High School Diploma, Tempo School, Edmonton, AB, June 2016

Honours and Awards

Canada Graduate Scholarship – Master’s, NSERC, 2020 (\$17,500)

Graduate Entrance Scholarship, UBC, 2020 (deferred) (\$17,500)

NSERC Undergraduate Student Research Award, NSERC/UBC, 2020 (\$7,969)

Faculty of Arts Graduate Award, UBC, 2020 (\$5,096)

Trek Excellence Scholarship for Continuing Students, UBC, 2019 (\$1,500)

ARTA Scholarship, Alberta Retired Teachers’ Association, 2019 (\$3,000)

Wesbrook Scholar, UBC, 2019 (\$1,000)

HSBC Emerging Leader Scholarship, UBC, 2019 (\$5,000)

Suedfeld Scholar Award, UBC Psi Chi, 2019 (\$500)

PSYC 217 Poster Award, 1st Place, UBC Psychology, 2018

Student Scholarship in Arts, UBC Faculty of Arts, 2018 (\$1,000)

Trek Excellence Scholarship for Continuing Students, UBC, 2017 (\$1,500)

Stephen Straker Arts One Prize, UBC Arts One Program, 2017 (\$1,000)

University of BC Sopron Memorial Scholarship, UBC, 2016 (\$5,000)

Dean’s List, UBC Faculty of Arts, 2016-17, 2017-18, 2018-19, 2019-20

University activities (Research)

Publications

Paper. Xiao, D., **Forys, B. J.**, Vanni, M. P., & Murphy, T. H. (2021). MesoNet: automated scaling and segmentation of mouse mesoscale cortical maps using machine learning. *Nature Communications*, 12(1), 5992. <https://doi.org/10.1038/s41467-021-26255-2>

Paper. Hamden, J.E., Salehzadeh, M., Gray, K. M., **Forys, B. J.**, & Soma, K. K. (2021). Isoflurane stress induces glucocorticoid production in mouse lymphoid organs. *Journal of Endocrinology*, 251(2), 1-13. <https://doi.org/10.1530/JOE-21-0154>

Paper. Hamden, J. E.*, Gray, K. M.*, Salehzadeh, M., Kachkovski, G. V., **Forys, B. J.**, Ma, C., ... Soma, K. K. (2021). Steroid profiling of glucocorticoids in microdissected mouse brain across development. *Developmental Neurobiology*, 81(2), 189–206. <https://doi.org/10.1002/dneu.22808>

Paper. **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*. <https://doi.org/10.1523/ENEURO.0096-20.2020>

Paper. **Forys, B.***, Xiao, D.*, Gupta, P., Boyd, J. D., & Murphy, T. H. (2018). Real-time markerless video tracking of bodyparts in mice using deep neural networks. *BioRxiv*, 482349. <https://doi.org/10.1101/482349>

Software. Xiao, D., **Forys, B. J.**, Vanni, M. P. & Murphy, T. H. (2021). MesoNet: automated scaling and segmentation of mouse mesoscale cortical maps using machine learning. Code Ocean. doi:10.24433/CO.1919930.V1.

Software. Kryklywy, J.H., **Forys, B. J.**, & Todd, R.M. (2021). Pattern Component Modelling for R (PCM-R), R package, pre-release.
*First co-authors

Papers in Preparation

Paper. Ehlers, M. R., Kryklywy, J.H., **Forys, B. J.**, Beukers, A. O., Moore, S. R., Anderson, A. K., & Todd, R. M. (in preparation). Hedonic but not sensory associations are reactivated with human emotional learning.

Paper. Kryklywy, J. H., **Forys, B. J.**, Vieira, J. B., Quinlan, D. J., Culham, J. C., & Mitchell, D. G. V. (under review). Dissociating representation of affect and motion in the human brain.

Poster Presentations

Poster Presentation. Sidarth, A.*, **Forys, B. J.**, & Todd, R. M. (2021). Cognitive control on reward-seeking behavior. Presented at UBC Multidisciplinary Undergraduate Research Conference, 2021, and UBC Parkinson’s and Alzheimer’s Targeted Hope and Support Conference, 2021.

Poster Presentation. Xiao, D., Gupta, P., **Forys, B.**, & Murphy, T. H. (2020). Real-time forepaw movement coded auditory feedback promotes motor skill learning in mice. Presented at UBC Psychiatry Virtual Research Day, 2020.

Poster Presentation. Forys, B. J., Xiao, D., Gupta, P., Boyd, J. D., & Murphy, T. H. (2019). Short latency (~100 ms) markerless video tracking of body parts in mice using deep neural networks. Presented at Neuroscience 2019, Chicago, IL., and UBC Neuroscience Undergraduate Research Conference, 2020.

Poster Presentation. Xiao, D., Forys, B. J., Tandun, R., & Murphy, T. H. (2019). Automated alignment and segmentation of mouse mesoscale brain images using machine learning. Presented at Neuroscience 2019, Chicago, IL.; UBC Future of Health Research Day; UBC School of Biomedical Engineering Symposium, 2019.

Poster Presentation. Forys, B., Tobiansky, D. J., & Soma, K. K. (2019). A novel steroidogenic model for reward-seeking behaviour. Presented at UBC Psychology Undergraduate Research Conference, 2019.

Poster Presentation. Forys, B., Xiao, D., Gupta, P., Boyd, J. D., & Murphy, T. H. (2018). Real-time markerless video tracking of bodyparts in mice using deep neural networks. Presented at UBC Brain Circuits Cluster 2018; Neuroextravaganza 2018; UBC Undergraduate Neuroscience Conference 2019; UBC School of Biomedical Engineering Symposium 2019.

Poster Presentation. Tobiansky, D. J., Kachkovski, G., Enos, R. T., Schmidt, K. L., Ma, C., **Forys, B.,** Hamden, J. E., Jalabert, C., Floresco, S. B., Murphy, E. A., Soma, K. K. (2018). Perinatal sucrose exposure in rats disrupts hormones, brain, and behavior in adulthood. Presented at Neuroscience 2018, San Diego, CA. (Credited on poster, not on abstract)

Poster Presentation. Forys, B., Phi, J., Shi, L., Yu, V. ZH. (2018). Emojinal perception: Emoji presence and perceived emotional valence. Presented at UBC Psychology Undergraduate Research Conference, 2018 (PSYC 217 Poster Award, 1st place winner).

Poster Presentation. Forys, B., Tandun, R., Cookson, J., & Xiao, D. (2018). Predicting facial and paw movement from cortical mesoscopic calcium activity in mice: A machine learning perspective. Presented at UBC Multidisciplinary Undergraduate Research Conference, 2018.

**Trainee*

Teaching Positions

Teaching Fellow with Prof. Catherine Rawn, PSYC 217, Research Methods in Psychology, UBC Psychology, 2021.

Teaching Assistant with Prof. Rebecca Todd, PSYC 365, Cognitive Neuroscience, UBC Psychology, 2021.

Teaching Fellow with Prof. Catherine Rawn, PSYC 217, Research Methods in Psychology, UBC Psychology, 2020.

Teaching Fellow with Prof. Catherine Rawn, PSYC 218, Analysis of Behavioural Data, UBC Psychology, 2020.

Teaching Assistant with Prof. David King, PSYC 305A, Personality Psychology, UBC Psychology, 2019.

Research Positions

Graduate Student, 2020-present, and Research Assistant with Prof. Rebecca Todd, UBC Psychology, 2019-present.
Investigating aversive responses and learning using stimulus associations. Learned PsychoPy, Psychtoolbox, LabChart, and PowerLab. Honours thesis: *Modulating effort cost in human avoidance behaviours*.

Graduate Student and Research Assistant with Prof. Alan Kingstone, UBC Psychology, 2020-present.
Investigating properties of aversive and ambiguous sounds.

Research Assistant with Prof. Kiran Soma, UBC Psychology, 2018-present.
Researching methods for predicting local neurosteroid concentration from circulating steroid hormone concentrations. Learned bioinformatics, histological analysis, cluster computing, and R for statistics. Honours thesis: *A novel steroidogenic model for reward-seeking behaviour*. Directed studies paper: *Modelling corticosterone synthesis and regeneration in the mouse brain*.

Laboratory Assistant with Prof. Tim Murphy, UBC Psychiatry, 2017-20.
Investigated movement and behavioural dynamics of mice using movement tracking; explored the relationship between body part movement and mesoscale brain activity in mice. Learned Python, MATLAB, and brain slicing.

Workshop Host, Databinge; DeepLabCut. UBC Neuroscience, 2018.
Taught members of UBC's neuroscience community how to use a novel movement tracking system.

University Activities (Leadership & Extracurricular)

Diversity Mentor, UBC Psychology, 2021-present.
Mentored students interested in applying to graduate school in Psychology, guiding them through the mentor selection and school application process and meeting with them on a regular basis.

Vice President Internal, UBC Chapter of Psi Chi, 2019-20.
Planned and secured funding and resources to support events for students interested in psychology. Applied for the Ruth Hubbard Cousins Chapter Award, granted annually to one out of 1,150 Psi Chi chapters worldwide, which our chapter received.

Vice President, Academic-Internal, Model United Nations Student Association, 2018-20.
Hired staff for, prepared materials for, and oversaw execution of Model UN conferences at UBC.

Co-Founder and Vice President, AMS Turing Club @ UBC, 2017-20.
Led workshops on a variety of artificial intelligence topics for UBC students of all backgrounds; marketed the club.

Volunteer Web Developer, Ubysses Publications Society, 2017-18.
Implemented several front-end and back-end improvements and fixes on the Ubysses website; developed a software package to make it easier for Ubysses web developers to start working with the website on their own computers.

Community and Volunteer Activities

Software Engineering Team Member, rLoop Incorporated, 2017-present.

Works with a global team of engineers and designers to design a one-person flying machine for the HeroX GoFly competition. Helped design an AI-based communication system for a hyperloop vehicle in the SpaceX Hyperloop Competition.

Skills

Programming Languages: Python, bash, R, MATLAB, JavaScript, C, C++, HTML/CSS, Java

Machine Learning and Computer Vision: TensorFlow, Keras, CUDA, OpenCV

Web Frameworks: Django, Flask, npm, Bootstrap, Wordpress, Squarespace

Infrastructure: Docker, VirtualBox, QEMU

Visualization: Photoshop, Illustrator, Inkscape, Inventor, Unity, Blender, AutoCAD, 3DSMax, Revit

Experimentation Technology: PsychoPy, PsychToolbox, BioSemi EEG, EEGLAB, LabChart/PowerLab

Professional affiliations

Member, Society for Neuroscience, 2019-present.

Member, Psi Chi International Honor Society in Psychology, 2019-present.

Student member, Association for Psychological Science, 2018-present.

Languages

English – native; **French** – fluent