

## Brandon Forys

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### Education

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

Senior-level average: 90% | Psychology average: 90% | Cumulative average: 89%

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

### Honours and Awards

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

**NSERC Undergraduate Student Research Award**, NSERC/UBC, 2020 (\$4,500)

**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, 1<sup>st</sup> 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.** Hamden, J. E., Gray, K., Saledzadeh, M., Kachkovski, G. K., **Forys, B. J.**, Ma, C., Austin, S., Soma, K. K. (2021). Steroid profiling of glucocorticoids in microdissected mouse brain across development. *Developmental Neurobiology*. <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>

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

**Paper.** Xiao, D., **Forys, B. J.**, Vanni, M. P., & Murphy, T. H. (under review). MesoNet: automated scaling and segmentation of mouse mesoscale cortical maps using machine learning.

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

#### Poster Presentations

**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, 1<sup>st</sup> 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.

### Teaching Positions

**Teaching Fellow** 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 and Research Assistant** with Prof. Alan Kingstone, UBC Psychology, 2020-present.

**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. Supervised Honours thesis: *Modulating Effort Cost in Human Avoidance Behaviours*.

**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.

Supervised Honours thesis: *A Novel Steroidogenic Model for Reward-Seeking Behaviour*. Supervised directed studies paper: *Modelling Corticosterone Synthesis and Regeneration in the Mouse Brain*.

**Laboratory Assistant** with Prof. Tim Murphy, UBC Psychiatry, 2017-20.

Investigating movement and behavioural dynamics of mice using movement tracking; exploring 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)

**Vice President Internal,** UBC Chapter of Psi Chi, 2019-20.

**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,** Ubyyssey Publications Society, 2017-18. Implemented a number of front-end and back-end improvements and fixes on the Ubyyssey website; developed a software package to make it easier for Ubyyssey 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