Brandon Forys
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Education

MA in Psychology, the University of British Columbia, Vancouver, BC, November 2022
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

Faculty of Arts Graduate Award, UBC, 2023
Stanley Coren Prize in Psychology, UBC, 2023
Four Year Fellowships (4YF) For PhD Students, UBC, 2022-2026
President's Academic Excellence Initiative PhD Award, UBC, 2022-2026
Canada Graduate Scholarship – Doctoral, NSERC, 2022-2026
Faculty of Arts Graduate Award, UBC, 2021 (deferred from 2020)
Canada Graduate Scholarship – Master's, NSERC, 2020
NSERC Undergraduate Student Research Award, NSERC/UBC, 2020
Faculty of Arts Graduate Award, UBC, 2020
Trek Excellence Scholarship for Continuing Students, UBC, 2019
ARTA Scholarship, Alberta Retired Teachers' Association, 2019
Wesbrook Scholar, UBC, 2019
HSBC Emerging Leader Scholarship, UBC, 2019
Suedfeld Scholar Award, UBC Psi Chi, 2019
PSYC 217 Poster Award, 1st Place, UBC Psychology, 2018
Student Scholarship in Arts, UBC Faculty of Arts, 2018
Trek Excellence Scholarship for Continuing Students, UBC, 2017
Stephen Straker Arts One Prize, UBC Arts One Program, 2017
University of BC Sopron Memorial Scholarship, UBC, 2016
Dean's List, UBC Faculty of Arts, 2016-17, 2017-18, 2018-19, 2019-20

University activities (Research)

Publications

Kryklywy, J. H., **Forys, B. J.**, Vieira, J. B., Quinlan, D. J., Culham, J. C., & Mitchell, D. G. V. (2023). Dissociating representation of affect and motion in visual cortices. *Cognitive, Affective, & Behavioural Neuroscience,* 1-24. https://doi.org/10.3758/s13415-023-01115-2

Forys, B. J., Tomm, R. J., Stamboliyska, D.**, Terpstra, A. R., Clark, L., Chakrabarty, T., Floresco, S. B., & Todd, R. M. (2023). Gender impacts the relationship between mood disorder symptoms and effortful avoidance performance. *eNeuro, 10*(2). https://doi.org/10.1523/ENEURO.0239-22.2023

Forys, B. J., Tomm, R. J., Stamboliyska, D.**, Terpstra, A. R., Clark, L., Chakrabarty, T., Floresco, S. B., & Todd, R. M. (2022). Gender impacts the relationship between mood disorder symptoms and effortful avoidance performance. *BioRxiv*. https://doi.org/10.1101/2022.06.21.497075

Ehlers, M. R., Kryklywy, J. H., Beukers, A. O., Moore, S. R., **Forys, B. J.**, Anderson, A. K., & Todd, R. M. (2021). Reactivation of hedonic but not sensory representations in human emotional learning. *BioRxiv*. https://doi.org/10.1101/2021.11.25.469891

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

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

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

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*, *7*(3). https://doi.org/10.1523/ENEURO.0096-20.2020

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

Papers in Preparation

Ehlers, M. R., Kryklywy, J. H., Beukers, A. O., Moore, S. R., **Forys, B. J.**, Anderson, A. K., & Todd, R. M. (in preparation). Reactivation of hedonic but not sensory representations in human emotional learning.

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. https://doi.org/10.24433/CO.1919930.V1

Kryklywy, J.H., **Forys, B. J.**, & Todd, R.M. (2021). Pattern Component Modelling for R (PCM-R), R package, pre-release. https://github.com/bf777/PCMforR

**First co-authors*

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Poster Presentations

Forys, B. J., Tomm, R. J., Kryklywy, J. H., Clark, L., Chakrabarty, T., Floresco, S. B., & Todd, R. M. (2023). Using a novel form of pattern component modeling with representational similarity analysis to model information learned in active and inhibitory avoidance and reward-seeking. Presented at International Conference on Learning and Memory, 2023, Huntington Beach, CA.

Forys, B. J., Kryklywy, J. H., Ehlers, M. R., Moore, S. R., Beukers, A. O., Anderson, A. K., & Todd, R. M. (2022). Modelling representations of continuously shifting stimuli: a novel sliding window approach. Presented at Cognitive Neuroscience Society Annual Meeting, 2022, San Francisco, CA.

Zheng, J.**, **Forys, B. J.,** & Todd, R. M. (2022). Maladaptive Transfer of Cognitive Effort in Emotional Situations. Presented at UBC Psychology Undergraduate Research Conference, 2022.

Forys, B. J., Tomm, R. J., Stamboliyska, D.**, Terpstra, A. R., Clark, L., Chakrabarty, T., Floresco, S. B., & Todd., R. M. (2021). Gender selectively moderates relationships between mood disorder symptoms and performance of effort related avoidance and reward-seeking tasks. Presented at Neuroscience 2021.

Tomm, R. J., **Forys, B. J**., Daly, I. D., Terpstra, A. R., Clark, L., Chakrabarty, T., Floresco, S. B., & Todd., R. M. (2021). Depressive and anxiety symptom clusters in humans are related to distinct avoidance profiles in a cross-species translation of a go/no-go avoidance task. Presented at Neuroscience 2021.

Daly, I. D., Tomm, R. J., **Forys, B. J**., Terpstra, A. R., Clark, L., Chakrabarty, T., Floresco, S. B., & Todd., R. M. (2021). Levels of depressive and anxiety symptoms in humans predict distinct patterns of reward-seeking: A cross-species translation of an appetitive go/no-go task. Presented at Neuroscience 2021.

Tomm, R. J., Daly, I. D., **Forys, B. J.**, Floresco, S. B., & Todd, R. M. (2021). Anxiety and depressive symptoms in humans are related to distinct avoidance profiles in a cross-species translation of a go/no-go avoidance task. Presented at the International Behavioural Neuroscience Society Meeting, 2021.

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.

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.

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.

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.

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.

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.

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)

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).

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.

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Talks

Invited Talk. Forys, B. J. & Todd, R. M. (2023). Using fMRI to model representational content in a translational context. Delivered at UBC MRI Research Centre Annual Retreat, 2023, Vancouver, BC.

Data Blitz. Forys, B. J., Kryklywy, J. H., Ehlers, M. R., Moore, S. R., Beukers, A. O., Anderson, A. K., & Todd, R. M. (2022). Modelling representations of continuously shifting stimuli: a novel sliding window approach. Delivered at Cognitive Neuroscience Society Annual Meeting, 2022, San Francisco, CA.

Teaching Positions

Teaching Fellow with Prof. Catherine Rawn, PSYC 217, Research Methods in Psychology, UBC Psychology, 2023.
Teaching Assistant with Prof. Rebecca Todd, PSYC 365, Cognitive Neuroscience, UBC Psychology, 2023.
Teaching Fellow with Prof. Andrew Rivers, PSYC 217, Research Methods in Psychology, UBC Psychology, 2022.
Teaching Assistant with Prof. Rebecca Todd, PSYC 365, Cognitive Neuroscience, UBC Psychology, 2022.
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 physical and cognitive effort for avoidance and reward learning using stimulus associations, through behavioural and neuroimaging methods.
- Masters' thesis: *Gender moderates the relationship between mood disorder symptoms and effortful avoidance performance.*
- Honours thesis: *Modulating effort cost in human avoidance behaviours.*
- Conducted regressions, mult-level models, and correlational analyses on data I collected from over 1,000 participants.
- Gained experience with fMRI preprocessing and analysis methods (general linear model, representational similarity analysis, psychophysiological interactions).
- Learned PsychoPy, Psychtoolbox, LabChart, and PowerLab.

Graduate Student and Research Assistant with Prof. Alan Kingstone, UBC Psychology, 2020-present.
Investigating properties of aversive and ambiguous sounds in different contexts through a series of behavioural studies.
- Learned Unity and C#.
- Applying sentiment analysis and natural language classifiers to qualitative data collected from 80+ participants.

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.
Developed and implemented software to investigate movement and behavioural dynamics of mice using movement tracking, and to automatically segment mesoscale brain images using machine learning methods.
- Learned Python, MATLAB, and brain slicing.

University Activities (Leadership & Extracurricular)

Teaching Assistant and Guest Lecturer, UBC fMRI Brain Camp, 2023.
Taught five sessions on fMRI preprocessing and open data practices, including how to use the BIDS format, conduct quality control, run representational similarity analysis, use fMRIprep, and run analyses on high-performance computing platforms. Provided technical support to students at all stages of preprocessing. Helped design and conceptualize the course structure.

Diversity Mentor, UBC Psychology, 2021-present.
Mentors 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, Ubyssey Publications Society, 2017-18.

Implemented several front-end and back-end improvements and fixes on the Ubyssey website; developed a software package to make it easier for Ubyssey web developers to start working with the website on their own computers.

Community and Volunteer Activities

Software Engineering Team Member, rLoop Incorporated, 2017-2023.

Worked 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, JavaScript, MATLAB, C#, HTML/CSS, Java
Machine Learning and Computer Vision: TensorFlow, Keras, OpenCV
Web Frameworks: Django, Flask, npm, Bootstrap, Wordpress, Squarespace
Infrastructure: Docker, VirtualBox, QEMU, Azure, High Performance Computing (SLURM, PBS)
Visualization: Photoshop, Illustrator, Inkscape, Unity, Blender, AutoCAD, 3DSMax, Revit, Inventor
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.

Languages

English – native; **French** – fluent