Thomas Donald Grant Ferguson
Post-Doctoral Researcher
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Computing Science
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Education

2022 to Present – Post-doctoral Researcher, Department of Computing Science, University of Alberta
2017 to 2022 – PhD, Cognition and Brain Science, 2017 to Present, University of Victoria, Victoria, B.C.
Dissertation title: The impact of stress on the explore-exploit dilemma
2014 to 2016 – Master of Science, Experimental Neuropsychology, University of Victoria, Victoria, B.C.
Thesis title: Navigational cognition: What you do and what you show isn't always all you know
2009 to 2014 – Bachelor of Science (with distinction), Psychology, University of Victoria, Victoria, B.C.

Fellowships, Honours, and Awards

2023 – NSERC PDF Fellowshowhip ($90 000)
2022 – Dr. Rowland and Muriel Haryett Neuroscience Fellowship ($50 000)
2021 – R.B. May Graduate Award ($1 000)
2021 – Mitacs Accelerate Fellowship ($15 000)
2021 – University of Victoria Graduate Award ($3000) & University of Victoria - Outstanding publication Award ($1000)
2021 – Biotalent Canada Student Work Placement Grant ($5000)
2020 – Biotalent Canada Student Work Placement Grant ($7500)
2020 – Mitacs Accelerate Fellowship ($30 000)
2020 – University of Victoria Donor Award ($972.50) – Norma Wilson Graduate Scholarship
2020 – University of Victoria Graduate Award ($4000)
2019 – University of Victoria Donor Award - Dr. Julius F. Schleicher Graduate Scholarship ($6960)
2019 – University of Victoria Graduate Award ($4500) & University of Victoria – Outstanding Publication Award ($1500)
2018 – Mitacs Accelerate Fellowship ($15 000)
2015 – NSERC Scholarship CGS: Master's Program ($17 500) & University of Victoria President's Research Scholarship ($4000)
2014 – University of Victoria Graduate Entrance Scholarship ($13 500) & University of Victoria Graduate Award ($5000)

Programming and Technical Skills

Advanced Knowledge: MATLAB, R, Python, Unreal Engine
Intermediate Knowledge: HTML5, iOS Applications (Swift), Markdown
Beginner Knowledge: Unity
Other skills: Computational Modeling, Bayesian and Frequentist Statistics, Neuroimaging (EEG, fNIRS), Microsoft Office suite, JASP, SPSS

Publications

Journal Articles

1. **Ferguson, T.D.**, Fyshe, A., White, A., & Krigolson, O.E. (manuscript under review). Humans adopt different exploration strategies depending on the environment.
2. Hammerstrom, M.R., **Ferguson, T.D.**, Pepler, H.L., Pluta, A., Binstead, G., & Krigolson, O.E. (manuscript under review). Using neural signals to investigate athlete burnout.
3. Rowe, J.L., **Ferguson, T.D.,** & Krigolson, O.E. (2021). The impact of stress and anxiety on contextual updating and feedback learning. *The Arbutus Review, 12 (1*), 84-103.
4. Stegemoller, E.L., **Ferguson, T.D.,** Zaman, A., Hibbing, P., Izbicki, P., & Krigolson, O.E. (2021). Finger tapping to different styles of music and changes in cortical oscillations. *Brain and Behaviour*, 1-10.
5. **Ferguson, T.D.**, Bub, D.N., Masson, M.E.J., and Krigolson, O.E. (2021). The role of cognitive control and top-down processes in motor affordances. *Attention, Perception, & Psychophysics, 82,* 2017-2032.

6. Krigolson, O.E., **Ferguson, T.D.**, Colino, F.L, & Binsted, G. (2021) Distribution of Practice Combined with Observational Learning has Time Dependent Effects on Motor Skill Acquisition. *Perceptual & Motor Skills, 128(2),* 885-899.
7. Hammerstrom, M.R., **Ferguson, T.D.,** Williams, C.C., & Krigolson, O.E. (2021). What happens when right means wrong? The impact of conflict arising from competing feedback responses. *Brain Research, 1791, 147393.*
8. Williams, C.C., **Ferguson, T.D.**, Hassall, C.D., Wright, B., and Krigolson, O.E. (2021). Dissociated Neural Signals of Conflict and Surprise in Effortful Decision Making. *Neuropsychologia, 155, e13722.*
9. Williams, C.C., **Ferguson, T.D.**, Hassall, C.D., Abimbola, W., and Krigolson, O.E. (2021). The ERP, Frequency, and Time-Frequency Correlates of Reward Processing: Insights from a Large Sample Study. *Psychophysiology, 58 (2), e13722*
10. Toppings, J.L., **Ferguson, T.D.,** & Krigolson, O.E. (2020). The effects of acute stress on neural correlates of decision making. *The Arbutus Review, 11 (2*), 62-90.
11. **Ferguson, T.D**., Williams, C.C., Skelton, R.W., & Krigolson, O.E. (2019). Reward processing of cues following completion of a spatial navigation task, *Cognition, 189*, 65-75.
12. **Ferguson, T.D**., Livingstone-Lee, S.A., & Skelton, R.W. (2019). Incidental learning and competence in allocentric and egocentric strategies by both men and women in a dual-strategy virtual Morris Water Maze. *Behavioural Brain Research, 364*, 281-295.
13. van Gerven, D.J.H., **Ferguson, T.D**., & Skelton, R.W. (2016). Acute stress switches spatial navigation strategy from egocentric to allocentric in a virtual Morris water maze. *Neurobiology of learning and memory, 132,* 29-39.

Presentations (Invited Talks and Oral Presentations)

1. **Ferguson, T.D.**, & Krigolson, O.E. (2020). Using EEG to investigate multiple neuromodulatory systems underlying stress & decision making. Oral presentation at the Cognitive Neuroscience Society's 2020 Annual Meeting, Virtual Conference.
2. **Ferguson, T.D**., Geneau, M., & Krigolson, O.E. (2020). The effect of mindfulness training on decision making performance in athletes. Talk given at Canadian Sports Institute Pacific, Victoria, B.C.
3. **Ferguson, T.D**. (2019). Using EEG to better understand the Brain-Behaviour relationship, Invited talk given for PSYC 351D, University of Victoria, Victoria, B.C.
4. **Ferguson, T.D**. (2019). The effect of stress on executive function and decision making, Invited talk given for PSYC 451D, University of Victoria, Victoria, B.C.
5. **Ferguson, T.D.**, Williams, C.C., Colino, F.C., Wright, B., & Krigolson, O. E. (2018). Chronic and acute stress modulate attention and control in a decision-making paradigm. Oral presentation at Northwest Cognition and Memory, Richmond, B.C.
6. **Ferguson, T.D.** (2018). An introduction to EEG as a research method, Invited talk given for PSYC 351D, University of Victoria, Victoria, B.C.

Published Abstracts

1. Krigolson, O.E., Williams, C.C., **Ferguson, T.D.**, Hecker, K., & Binsted, G. (2021). Taking EEG to Mars: Mobile assessment of human brain performance in the HI-SEAS Mars habitat, Psychophysiology, 58, S83.
2. Williams, C.C., **Ferguson, T.D.,** Hassall, C.D., Abimbola, W., & Krigolson, O.E. (2020). The reward positivity, delta, and theta in a sample of 500 participants. Psychophysiology, 57, S47.
3. **Ferguson, T.D.,** Williams, C.C., Colino, F.C., Wright, B.E., & Krigolson, O.E. (2018). More attention, greater control: Chronic stress correlates with differences in alpha and theta levels. Psychophysiology, 55, S114.
4. Colino, F.C., **Ferguson, T.D**., Williams, C.C., Colino, F.C., & Krigolson, O.E. (2018). Learning medical diagnosis: The effect of expectation to teach, Psychophysiology, 55, S76.
5. Van Gerven, D.J.H., **Ferguson, T.D.**, & Skelton, R.W. (2013). The acquisition of spatial and non-spatial navigation strategies in a dual-strategy virtual Morris water maze. Canadian Journal of Experimental Psychology, 67(4), 300.

Posters

1. **Ferguson, T.D.**, & Krigolson, O.E. (2022). Stress disrupts uncertainty signals and reduces exploration. Poster presented at A.I. Week, Edmonton, A.B.

2. LaCasse, J.M., Devine, S., Profitt, M., **Ferguson, T. D.,** Eppinger, B., & Brake, W.G. (2022). The impact of hormonal contraceptives on spatial navigation in the virtual Hex maze task. Poster presented at Society for Neuroscience, San Diego, CA.
3. Rowe, J.L., **Ferguson, T.D**., & Krigolson, O.E. (2021) Decision-making under chronic stress and anxiety: State and trait anxiety impact contextual updating but not feedback learning, Talk given at North-West Cognition and Memory (2021), Virtual Conference.
4. Rowe, J.L., **Ferguson, T.D.**, & Krigolson, O.E. (2021) The impact of stress and anxiety on feedback learning and contextual updating, Poster presented at the Jamie Cassels Undergraduate Research Fair (JCURA), Victoria, B.C.
5. **Ferguson, T.D**., & Krigolson, O.E. (2020) Using EEG to investigate multiple neuromodulatory systems underlying stress & decision making. Poster presented at the Cognitive Neuroscience Society's 2020 Annual Meeting, Virtual Conference.
6. Carey, E. **Ferguson, T.D.**, Williams, C.C., & Krigolson, O.E. (2020) The accumulation of cognitive fatigue among undergraduate university students. Poster presented at the Making Waves Conference 2020, Victoria, B.C.
7. Toppings, J.L, **Ferguson, T.D.**, & Krigolson, O.E. (2020) Is stress ruining your life? The effects of acute stress on the neural correlates of decision-making. Poster presented at the Jamie Cassels Undergraduate Research Fair (JCURA), Victoria, B.C.
8. Gill, G., **Ferguson, T.D.,** Luehr, S., & Krigolson, O.E. (2019) An Implicit Measure of Cognitive Focus: Evidence from an Oddball Paradigm. Poster presented at the Northwest Cognition and Memory 2019, Victoria, B.C
9. Trska, R., **Ferguson, T.D.**, Walzak, A., Wright, B., & Krigolson, O.E. (2019), Mobile Based EEG assessment of fatigue in clinical practioners, Poster presentation at the Cognitive Neuroscience Society annual meeting, San Francisco, California
10. **Ferguson, T.D**., Williams, C.C., Skelton, R.W., & Krigolson, O. E. (2018). Great, I found it: Evidence for the association of reward with spatial information following navigation with the use of EEG. Poster presentation at the Canadian Association for Neuroscience annual meeting, Vancouver, B.C.
11. Hammerstrom, M., Williams, C.C., **Ferguson, T.D.**, Colino, F.C., Wright, B., & Krigolson, O. E. (2018). Neural Learning Signals Reflect Task Performance in a Medical Context. Poster presented at the Northwest Cognition and Memory 2018, Richmond, B.C.
12. **Ferguson, T.D.**, van Gerven, D., & Skelton, R.W. (2015). Most people use both allocentric and egocentric strategies to solve a dual-strategy Morris water maze. Poster presented at the International Behavioral Neuroscience Society, Victoria, B.C.
13. **Ferguson, T.D.**, van Gerven, D., & Skelton, R.W. (2014). Strategy choice in a new dual strategy virtual morris water maze depends on environmental features, instructions and gender. Poster presented at NorthWest Cognition and Memory, Victoria, B.C.
14. van Heyningen, T., **Ferguson, T.D**., van Gerven, D., & Skelton, R. (2014). Low-level stress strongly affects navigational strategy choice in a dual-strategy virtual Morris water maze in both men & women. Poster presented at NorthWest Cognition and Memory, Victoria, B.C.

Professional activities and leadership skills

2017-2022 – PhD Candidate – Dr. Olave Krigolson

Role: Training undergrads, mentoring honours and master's students, organized a paper discussion group

2012-16 – Lab Manager/MSc Student – Dr. Ronald Skelton

Role: trained and coordinated undergrads, ran a paper discussion group

Honours Students Supervised (with Dr. Olave Krigolson)

Juliet Rowe – 2020 to 2021 – Thesis: The effect of chronic stress and anxiety on neural decision making in a 300-person sample

Patrick Montgomery – 2020 to 2021 – Thesis: Understanding the interaction between acute stress and common event-related potential components

Jill Toppings – 2019 to 2020 – Thesis: The effect of acute stress on neural decision making

Workshops

July 2022 – 2022 CIFAR Deep Learning and Reinforcement Learning Summer School, Online

August 2019 – 2019 Model Based Neuroscience Summer School – University of Amsterdam, Amsterdam, Netherlands

September 2017 – Time-series analysis of physiological data – University of Victoria, Victoria, British Columbia

September 2016 – Learning and Teaching in Higher Education – University of Victoria, Victoria, British Columbia

Science Outreach

February 2020 – Community-based presentation on the principals of conducting cognitive neuroscience research
March 2019 – Making Waves in Psychology (Undergraduate conference) – Abstract evaluation
February & March 2019 – Presenter to visiting secondary students the basics of conducting research in cognitive neuroscience
March 2018 – Community-based presentation on the principals of conducting research held by the Café Scientifique
February 2018 – Panelist for "Demystifying graduate school" held by the Centre for Biomedical Research

University Service

2018 to 2022 – University of Victoria Psychology Graduate Student Council (PGSC) – Founding member and GSS representative

2018-Present – University of Victoria Graduate Student Society Representative – Student Affairs, and Bylaw and Policy committees

2017-2018 – University of Victoria Graduate Executive Committee – Student Representative

Teaching

PSYC 300B: Statistical Methods in Psychology II – Spring 2020

Tutoring

PSYC 300A: Statistical Methods in Psychology II – Summer 2019
PSYC 300B: Statistical Methods in Psychology II – Summer 2019

Teaching Assistantships

PSYC 300B: Statistical Methods in Psychology II, University of Victoria, 2018-2021 (for Dr. David Medler)
PSYC 300A: Statistical Methods in Psychology I, University of Victoria, 2017-2020 (for Dr. David Medler)
NRSC 587: Advanced Topics in Neuroscience, University of Victoria, 2018 (for Dr. Olave Krigolson)
PSYC 351D: Biopsychology, University of Victoria, 2016 (for Dr. David Medler)
PSYC 323: Advanced Biopsychology, University of Victoria, 2015 (for Dr. Ronald Skelton)
PSYC 201: Research Methods in Psychology, University of Victoria, 2015 (for Dr. David Polson)
PSYC 210: Conceptual Foundations of Psychology, University of Victoria, 2015 (for Dr. Allison Barnes)
PSYC 215a: Introduction to Biological Psychology, University of Victoria, 2014 (for Dr. Ronald Skelton)
PSYC 415B: Biological Psychology, University of Victoria, 2014 (for Dr. Ronald Skelton)

Companies Consulted For

NeuroTech 40 Inc. (2021 to Present) – Data technician and analyst
Duties: data collection and analysis, interfaced with clients to discuss and interpret EEG results

SixEight Solutions Inc. (2020 to 2022) – Researcher and Consultant
Duties: conducted multiple literature reviews, data analysis for a pilot project, grant writing