Chad Williams

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SENIOR DATA SCIENTIST

WEARABLE BIOMETRICS | MACHINE LEARNING | SIGNAL PROCESSING

Current Position:

Senior Scientist
Psychiatry, Embodiment and Computation Laboratory
Brown University

Education:

PhD in Neuroscience
Certificate in Learning and Teaching in Higher Education
MSc in Neuroscience
BSc in Psychology

Career Highlights:

Published Papers:	25 (9 first author, 1 senior author)
Published Software:	3
H Index:	11
i10 Index:	11
Citations:	801
Awards & Distinctions:	$214,213
Research Grants:	$60,000

Website:

www.chadcwilliams.com

Additional Links:

Google Scholar
LinkedIn
Research Gate
GitHub
OSF
YouTube

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EDUCATION

University of Victoria, Victoria 2022
PhD – Neuroscience
Dissertation: Prediction Errors of Decision Demands Influence Cost-Benefit Computations in Reasoning
Supervisor: Dr. Olav Krigolson
Committee Members: Dr. Michael Inzlicht
Dr. Bruce Wright

University of Victoria, Victoria 2022
Certificate in Learning and Teaching in Higher Education

University of Victoria, Victoria 2018
M.Sc. – Neuroscience
Thesis: Neurocognitive Mechanisms of Type 1 and Type 2 Decision Making Processes
Supervisor: Dr. Olav Krigolson
Committee Members: Dr. Bruce Wright

University of Victoria, Victoria 2016
B.Sc. – Psychology (Honours with distinction)
Thesis: Reward Processing when Evaluating Goals: Insight into Hierarchical Reinforcement Learning
Supervisors: Dr. Clay Holroyd
Dr. Olav Krigolson

Coursera 2020
Certificate of Diversity and Inclusion in the Workplace

AWARDS AND DISTINCTIONS (Total: 19, $214,713)

Canada Graduate Scholarship – Doctoral (CGS D), NSERC - **$105,000**	2018
Research Scholarship (x2), Neuroeducation Network - **$40,000 total**	2015 & 2017
Canada Graduate Scholarship – Master's (CGS M), NSERC - **$17,500**	2016
President's Research Scholarship (x6), University of Victoria - **$12,000 total**	2016-2021
Research Scholarship, Howard E. Petch - **$7,500**	2018
Undergraduate Student Research Award (x2), NSERC - **$9,000 total**	2015 & 2016
Graduate Scholarship, Jarmila Vlasta Von Drak Thouvenelle - **$4,000**	2019
Memorial Award, Jean Downie Dey - **$2,175**	2020
Cameron Memorial Trust Scholarship - **$1,138**	2021
Community & Scholarship Fund, University of Victoria - **$1,000**	2016
BRAINSTORM Challenge Runner-Up - **$500**	2023
Poster Award, Society for Psychophysiological Research - **$400**	2018
Certificate of Academic Excellence, Canadian Psychological Association	2016

GRANTS (Total: 1; $60,000)

Alliance Grant, NSERC-Mitacs - **$60,000** 2021
Written with: Dr. Olav Krigolson

RESEARCH EXPERIENCE

Senior Scientist 2024 – Present
Psychiatry, Embodiment and Computation Laboratory
Carney Institute for Brain Science,
Brown University

Software Developer 2023 – Present
Inward VR

Computational Neuroscientist & Post-Doctoral Scholar 2022 – 2024
Autonomous Empirical Research Group
Carney Institute for Brain Science,
Brown University

Software Developer 2022 – 2023
Canadian Sports Institute Pacific Society

Neuroscientist, MSc Student, & PhD Candidate 2015 – 2022
Theoretical and Applied Neuroscience Laboratory, University of Victoria
Supervisor: Dr. Olav Krigolson

Scientist for Industrial Collaborations 2016 – 2022
Divergence Neuro Technologies
L3Harris Technologies
InteraXon
Avertus

Research Associate 2021 – 2022
Divergence Neuro Technologies Inc.

Laboratory Manager 2015 – 2017
Neuroeconomics Laboratory, University of Victoria
Supervisor: Dr. Olav Krigolson

Senior Researcher 2015 – 2016
Learning and Cognitive Control Laboratory &
Neuroeconomics Laboratory, University of Victoria
Supervisors: Dr. Clay Holroyd
Dr. Olav Krigolson

Research Assistant 2012 – 2014
Human Electrophysiology Laboratory, Simon Fraser University
Supervisor: Dr. John McDonald

TEACHING EXPERIENCE

Research Assistant Supervisor 2023 – 2024
Autonomous Empirical Research Group, Brown University
Research Assistants: Joshua Hewson

Academic Writing Seminar Series Instructor 2023 – 2024
Autonomous Empirical Research Group, Brown University

Workshop Instructor 2022 – 2024
Brainstorm Program, Carney Institute for Brain Science, Brown University
Workshops:
Brainstorm Challenge (2024): Data Reduction with Autoencoders
Brainstorm Challenge (2022): Differentiable Architecture Search
Co-Instructor: Dr. Sebastian Musslick

Online Educator: Practical Statistics with R 2020 – Present
Virtual
www.youtube.com/chadcwilliams

Sessional Lecturer 2020 – 2022
University of Victoria, Victoria
PSYC 300A – Statistical Methods in Psychology (*Summer, 2021*)
Median Course Evaluations: 5.0/5.0 on all questions

PSYC 351C – Cognitive Neuroscience (*Spring, 2021*)
Median Course Evaluations: 5.0/5.0 on all questions

MEDS 487 – Advanced Topics in Cognitive Neuroscience (*Spring, 2020*)
Median Course Evaluations: None available

Honour Student Supervisor 2016 – 2022
Theoretical and Applied Neuroscience Laboratory, University of Victoria
Honours Students: Mathew Hammerstrom (2019)
Marie Schulze (2018)
Talise Lindenbach (2017)

Guest Lecturer
University of Victoria, Victoria 2016 – 2022
Psychometrics (PSYC 401), *Design Project* (ECE 399), *Personal Health, Wellness and Potential* (EPHE 142), *Foundations of Physical Activity* (EPHE 143), *Motor Control* (EPHE 380), *Motor Learning* (EPHE 245)

Private Statistics Tutor for Introduction and Advanced Statistics 2018 – 2022
Chad C. Williams Consulting

Teaching Assistant 2016 – 2022
University of Victoria, Victoria
Advanced Statistics (PSYC 400A)
Statistics (PSYC 300A & PSYC 300B)
Psychometrics (PSYC 401)
Research Methods (PSYC 201)
Motor Learning (EPHE 245 & 380)
Ergonomics (EPHE 456)

Electroencephalography Methods Instructor 2015 – 2022
Theoretical and Applied Neuroscience Laboratory, University of Victoria

Neuroeducation Instructor at Elementary Schools 2016 – 2017
Neuroeconomics Laboratory, University of Victoria

Life Skills Educator for Individuals with Disabilities 2007 – 2015
Garth Homer Society
Lifetime Networks
Ridge Meadows Association for Community Living
Various Private Practices

LEADERSHIP EXPERIENCE

Brainstorm Challenge Workshop and Hackathon Lead Organizer 2023 – Present
Brown University

Society Member 2015 – Present
Cognitive Science Society
Society for Psychophysiological Research
Cognitive Neuroscience Society
Canadian Psychological Association

Neuroscience Representative in the Graduate Student Society's Graduate Representative Council 2017 – 2020
University of Victoria

Council Member of Student Affairs Committee 2017 – 2020
University of Victoria

EPHE Representative in the Neuroscience Graduate Student Association 2017 – 2020
University of Victoria

ORAL PRESENTATIONS (Total: 19, Presenting: 15)

Williams, C. C. An Open-Source Toolbox to Artificially Increase your Sample Sizes and Reduce the Complexity of Your Data. *Cognition and Brain Sciences Seminar,* Victoria, BC. 2023

Williams, C. C. Prediction Errors Influence Cost-Benefit Computations During Reasoning. *Society for Psychophysiological Research Meeting*, Vancouver, BC. 2022

Williams, C. C. A Window into the Rational Mind: Partnering Neuroimaging with Classical Reasoning Problems. *Cognition and Brain Sciences Seminar,* Victoria, BC. 2021

Williams, C. C. Response Conflict and Uncertainty Demonstrate Unique Neural Patterns When Engaging Cognitive Control. *Cognition and Brain Sciences Seminar,* Victoria, BC. 2020

Ciechanski P.**,** Kirton A., Wilson B., **Williams C. C.**, Anderson S. J., Cheng A., Lopushinsky S., & Hecker K. G. Transcranial direct-current stimulation enhances surgical skill learning by altering sensorimotor electrical activity. *CITAC Annual General Meeting 2019,* Banff, AB. 2019

Williams, C. C. It Takes 21 Lines of Code to Control a Robot with Your Mind: Interdisciplinary Collaborations as the Key to Advancing Science. *Neuroscience Graduate Program Seminar Series.* Victoria, BC. 2019

Williams, C. C. The Causes and Consequences for Difficult Decisions in Clinicians. *Neuroscience Kickoff,* Victoria, BC. 2019

Williams, C. C. From the Laboratory to the Real-World: The Versatility in Mobile EEG. *Neuroscience Kickoff,* Victoria, BC. 2018

Williams, C. C., Ferguson, T. D., Hammerstrom, M., Colino, F. L., Wright, B., & Krigolson, O. E. Putting the Learning Back into Neural Learning Systems. *Northwest Cognition and Memory 2018,* Richmond, BC. 2018

Ferguson, T. D.**, Williams, C. C.**, Colino, F. L., Wright, B., & Krigolson, O. E. More attention, greater control: Acute and chronic stress correlate with differences in alpha and theta oscillations. *Northwest Cognition and Memory 2018,* Richmond, BC. 2018

Middleton, J.**, Williams, C. C.**, Wright, B., & Krigolson, O. E. Midfrontal Theta: Real World Applications in Medical Education. *Northwest Cognition and Memory 2018,* Richmond, BC. 2018

Trska, R.**, Williams, C. C.**, Hassall, C. D., Holroyd, C., & Krigolson, O. E. Motor Learning: The Effect of Expectancy on Reward Positivity and Readiness Potential. *Northwest Cognition and Memory 2018,* Richmond, BC. 2018

Williams, C. C. Thinking, Alpha and Theta: Neural Indicators of System 1 and System 2. *Cognition and Brain Sciences Seminar,* Victoria, BC. 2018

Krigolson, O. E., **Williams, C. C.**, & Colino, F. L. Using Portable EEG to Assess Human Visual Attention. *Human-Computer Interaction International Conference 2017*, Vancouver, BC. 2017

Williams, C. C., Lindenbach, T., Wright, B., & Krigolson, O. E. Rapid Language Acquisition in a Reinforcement Learning Paradigm. *Northwest Cognition and Memory 2017*, Burnaby, BC. 2017

Williams, C. C. Learning Pathology with Reinforcements: A Neural Investigation. *Cognition and Brain Sciences Seminars*, Victoria, BC. 2016

Williams, C. C., Saffer, B. Y., McCulloch, R. B., & Krigolson, O. E. One is the loneliest number, but also the most valuable. *Cognitive Science Association for Interdisciplinary Learning,* Hood River, OR. 2016

Williams, C. C., Paget, M., Coderre, S., Burak, K., Wright, B., & Krigolson, O. E. Indicators of System I and System II Decision Making when Diagnosing Clinical Cases. *Northwest Cognition and Memory 2016*, Vancouver, BC. 2016

Williams, C. C., Paget, M., Coderre, S., Burak, K., Wright, B., & Krigolson, O. E. A Reinforcement Learning Approach to Medical Education. *University of Victoria's Making Waves*, Victoria, BC. 2016

POSTER PRESENTATIONS (Total: 34, Presenting: 13)

Hewson, J.T.S, Strittmatter, Y., Marinescu, I., **Williams, C.C.**, & Musslick, S. Bayesian Machine Scientist for Model Discovery in Psychology. *Neural Information Processing Systems.* 2023

Marinescu, I., Strittmatter, Y., **Williams, C.C.**, & Musslick, S. Expression Sampler as a Dynamic Benchmark for Symbolic Regression. *Neural Information Processing Systems.* 2023

Williams, C.C., Weinhardt, D., Wirzberger, M., & Musslick, S. Enhancing EEG Classification Performance through Generative Adversarial Networks: Investigating the Impact of Sample Sizes and Classifier Selection. *SimTech*. 2023

Williams, C.C., Weinhardt, D., Wirzberger, M., & Musslick, S. Augmenting EEG with Generative Adversarial Networks Enhances Brain Decoding Across Classifiers and Sample Sizes. *Cognitive Science*. 2023

Musslick, S., Hewson, J.T.S., Andrew, B., Strittmatter, Y., **Williams, C.C.**, Dang, G.T., Dubova, M., & Holland, J.G. An Evaluation of Experimental Sampling Strategies for Autonomous Empirical Research in Cognitive Science. *Cognitive Science.* 2023

Young, P., Ball, K., **Williams, C.C.**, & Nashmi, R. Investigating the Role of the Lateral Substantia Nigra Pars Compacta in Modulating Voluntary Movement. *Canadian Association for Neuroscience.* 2023

Williams, C. C., Van Oorschot, F., & Krigolson, O. E. A Window into the Rational Mind: Frontal Theta Power Reflects Rationality in a Classic Reasoning Task. *Society for Psychophysiology Research Meeting,* Virtual. 2021

Williams, C. C., Ferguson, T. D., Hassall, C. D., Abimbola, W., & Krigolson, O. E. The Reward Positivity, Delta, and Theta in a Sample of 500 Participants. *Society for Psychophysiology Research Meeting,* Virtual. 2020

Williams, C. C., & Krigolson, O. E. The Power Curve of the Brain: Reward Prediction Errors Follow Learning Curves. *Cognitive Neuroscience Society Annual Meeting*, San Francisco, CA. 2019

Middleton, J., **Williams, C. C.**, Wright, B., & Krigolson, O. E. Tonic Frontal Theta as an Assessment of Medical Decision Making in the Context of Medical Education. *Cognitive Neuroscience Society Annual Meeting*, San Francisco, CA. 2019

Williams, C. C., Kappen, M., Hassall, C. D., Wright, B., & Krigolson, O. E. Cognitive Control and Attention: Neurocognitive Mechanisms of System 1 and System 2 Thinking. *Society for Psychophysiology Research Meeting*, Quebec City, QC. 2018

Berman, T., **Williams, C. C.**, & Krigolson, O. E. Neural Correlates of Feedback Congruency: Top-Down Modulation of the Reward Positivity. *Canadian Neuroscience Annual Meeting*, Vancouver, BC. 2018

Hammerstrom, M., **Williams, C. C.**, Ferguson, T. D., Colino, F. L., Wright, B., & Krigolson, O. E. Neural Learning Signals Reflect Task Performance in a Medical Context. *Northwest Cognition and Memory 2018*, Richmond, BC. 2018

Walther, L., **Williams, C. C.**, & Krigolson, O. E. Early bird vs. night owl: Using EEG to measure your attention fluctuations throughout the day. *Northwest Cognition and Memory 2018*, Richmond, BC. 2018

Gagliardi, G., **Williams, C. C.**, Abimbola, W., & Krigolson, O. E. Using a Pair of Glasses to See Your Brainwaves. *Northwest Cognition and Memory 2018*, Richmond, BC. 2018

Walther, L., **Williams, C. C.**, & Krigolson, O. E. Morning person vs. night owl: Using EEG to measure your attention fluctuations throughout the day. *Jamie Cassels Undergraduate Research Awards Research Fair*, Victoria, BC. 2018

Foster, C., **Williams, C. C.**, Krigolson, O. E., & Fyshe, A. Decoding Word Semantics and Learning in EEG Data via an Artificial Language. *Cognitive Computational Neuroscience*, New York, NY. 2017

Williams, C., Schulze, M., Wright, B., & Krigolson, O. E. Neural correlates of system I and system II judgements when diagnosing diseases. *Society for Psychophysiological Research Meeting*, Vienna, Austria. 2017

Norton, A., Colino, F., **Williams, C. C.**, Hassall, C., & Krigolson, O. E. Finding a MUSE: Validation of a low-cost, portable system, for EEG research. *Society for Psychophysiological Research Meeting*, Vienna, Austria. 2017

Williams, C. C., Lindenbach, T., Colino, F., Wright, B., & Krigolson, O. E. Learning a Novel Language with Reinforcements: A Preliminary Neural Investigation. *Organization for Human Brain Mapping Meeting*, Vancouver, BC. 2017

Hassall, C. D., **Williams, C. C.**, & Krigolson, O. E. P300 scaling: Value, average reward, and the framing effect. *Organization of Human Brain Mapping Conference*, Vancouver, BC. 2017

Norton, A., **Williams, C. C.**, Hassall, C. D., Colino, F. L., Krigolson, O. E. A Validation of a Low-Cost Portable EEG System. *Organization for Human Brain Mapping Conference*, Vancouver, BC. 2017

Schulze, M., **Williams, C. C.**, Wright, B., Krigolson, O. E. System I and System II Decision Making in a Medical Context. *Northwest Cognition and Memory*, Vancouver, BC. 2017

Fitzpatrick, S., Fisher, S., **Williams, C. C.**, and Krigolson, O. E. Neurophysiological Assessment of Concussion: Variability in Reward Positivity. *Jamie Cassels Undergraduate Research Awards Research Fair*, Victoria, BC. 2017

Williams, C. C., Paget, M., Coderre, S., Burak, K., Wright, B., and Krigolson, O. E. The Neural Basis of Clinical Decision Making. *77th Annual Convention for the Canadian Psychological Association (CPA)*, Victoria, BC. 2016

Hassall, C. D., **Williams, C. C.**, & Krigolson, O. E. Good, better, best: Electroencephalographic responses scale to reward value. *77th Annual Convention for the Canadian Psychological Association (CPA)*, Victoria, BC. 2016

McCulloch, R. B., **Williams, C. C.**, Saffer, B. Y., & Krigolson, O. E. I lost all of my marbles, but I only care about the white ones. *77th Annual Convention for the Canadian Psychological Association (CPA)*, Victoria, BC. 2016

Lindenbach, T. N**.**, **Williams, C. C.**, and Krigolson, O. E. Rapid Learning of a Novel Language: An Electroencephalographic Investigation. *Northwest Cognition and Memory 2016*, Vancouver, BC. 2016

Pluta, A. J., **Williams, C. C.**, and Krigolson, O. E. The Effects of Background Alpha on Baseball Performance. Northwest Cognition and Memory, Vancouver, BC. 2016

Williams, C. C., Paget, M., Coderre, S., Burak, K., Wright, B., and Krigolson, O. E. Neural Systems That Underlie Clinical Decision Making: An Electroencephalographic Investigation. *Cognitive Neuroscience Society Annual Meeting*, New York, NY. 2016

Williams, C. C., Holroyd, C. B., & Krigolson, O. E. Reward Processing when Evaluating Goals: Insight into Hierarchical Reinforcement Learning. *Psychology Students of Vancouver Island Poster Session*, Victoria, BC. 2016

Williams, C. C., Hassall, C. D., & Krigolson, O. E. Reward Expectancy and the Reward Positivity: A Non-Linear Trend. *Society for Psychophysiological Research 55th Annual Meeting*, Seattle, WA. 2015

Williams, C. C., Hassall, C. D., & Krigolson, O. E. Reward Expectancy and the Reward Positivity: A Non-Linear Trend. *Northwest Cognition and Memory 2015*, Bellingham, OR. 2015

PUBLICATIONS (Total: 25, First Author: 9, Senior Author: 1)

†*Co-Senior Author*
**Co-First Author*

Musslick, S., Andrew, B., **Williams, C.C.**, Hewson, J.T.S., Li, S., Marinescu, I., Dubova, M., Dang, G.T., Strittmatter, Y. & Holland, J.G. (2024). AutoRA: Automated Research Assistant for Closed-Loop Empirical Research. *Journal of Open Source Software*, *9*(104), 6839. **(PDF)**

Young, P. A., Waller, O., Ball, K., **Williams, C. C.**, & Nashmi, R. (2024). Phasic stimulation of dopaminergic neurons of the lateral substantia nigra increases open field exploratory behaviour and reduces habituation over time. *Neuroscience*. **(PDF)**

Hewson, J.T.S, Strittmatter, Y., Marinescu, I., **Williams**†**, C.C.**, & Musslick†, S. (2023). Bayesian Machine Scientist for Model Discovery in Psychology. *Neural Information Processing Systems.* **(PDF)**

Marinescu*, I., Strittmatter*, Y., **Williams, C.C.**, & Musslick, S. (2023). Expression Sampler as a Dynamic Benchmark for Symbolic Regression. *Neural Information Processing Systems.* **(PDF)**

Williams*, C.C., Weinhardt*, D., Wirzberger, M., & Musslick, S. (2023). Augmenting EEG with Generative Adversarial Networks Enhances Brain Decoding Across Classifiers and Sample Sizes. *Cognitive Science*. **(PDF)**

Musslick, S., Hewson, J.T.S., Andrew, B., Strittmatter, Y., **Williams, C.C.**, Dang, G.T., Dubova, M., & Holland, J.G. (2023). An Evaluation of Experimental Sampling Strategies for Autonomous Empirical Research in Cognitive Science. *Cognitive Science.* **(PDF)**

Williams, C. C., Hassall, C. D., & Krigolson, O. E. (2023). Stabilizing Expectations when Shifting from Analytical to Intuitive Reasoning: The Role of Prediction Errors in Reasoning. *Cortex, 161,* 145-153. **(PDF)**

Williams, C. C., Ferguson, T. D., Hassall, C. D., Wright, B., & Krigolson, O. E. (2021). Dissociated Neural Signals of Conflict and Surprise in Effortful Decision Making: Theta Activity Reflects Surprise while Alpha and Beta Activity Reflect Conflict. *Neuropsychologia*, 107793. **(PDF)**

Williams, C. C., Ferguson, T. D., Hassall, C. D., Abimbola, W., & Krigolson, O. E. (2021). The ERP, Frequency, and Time-Frequency Correlates of Feedback Processing: Insights from a Large Sample Study. *Psychophysiology,* e13722, 1-26. **(PDF)**

Redden, R. J., Gagliardi, G. A., **Williams, C. C.**, Hassall, C. D., & Krigolson, O. E. (2021). Champ versus Chump: Viewing an Opponent's Face Engages Attention but Not Reward Systems. *Games, 12*(3): 1-20. **(PDF)**

Foster, C. **Williams, C. C.**, Krigolson, O. E., & Fyshe, A. (2021). Using EEG to Decode Semantics During an Artificial Language Learning Task. *Brain and Behavior 2021,* 1-11. https://doi.org/10.1002/brb3.2234. **(PDF)**

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*, 147393. **(PDF)**

Williams, C. C., Hassall, C. D., Lindenbach, T., & Krigolson, O. E. (2020). Reward Prediction Errors Reflect an Underlying Learning Process that Parallels Behavioural Adaptations: A Trial-to-Trial Analysis. *Computational Brain and Behaviour, 3,* 189-199. **(PDF)**

Colino, F. L., **Williams, C. C**., Hassall, C. D., Binsted, G., and Krigolson, O. E. (2020). The Impact of Wellness on Neural Learning Systems. *Neuroscience Letters, 714*, 134537. **(PDF)**

Williams, C. C., Kappen, M., Wright, B., & Krigolson, O. E. (2019). Thinking Theta and Alpha: Mechanisms of Intuitive and Analytical Reasoning. *NeuroImage, 189:* 574-580. **(PDF)**

Ciechanski, P., Hecker, K., Wilson, B., **Williams, C. C.**, Anderson, S., Cheng, A., Lopushinsky, S., & Kirton, A. (2019). Electroencephalography correlates of transcranial direct-current stimulation enhanced surgical skill learning: a replication and extension study. *Brain Research,* 146445. **(PDF)**

Ferguson, T., **Williams, C. C.**, Skelton, R. W., & Krigolson, O. E. (2019). Passively Learned Spatial Navigation Cues Evoke Reinforcement Learning Reward Signals. *Cognition, 189*: 65-75. **(PDF)**

Williams, C. C., Hecker, K. G., Paget, M. K., Coderre, S. P., Burak, K. W., Wright, B., & Krigolson, O. E. (2018). The Application of Reward Learning in the Real-World: Changes in the Reward Positivity Amplitude Reflect Learning in a Medical Education Context. *International Journal for Psychophysiology, 132*: 236-242. **(PDF)**

Pluta, A., **Williams, C. C.,** Binsted, G., Hecker, K. G., & Krigolson, O. E. (2018). Chasing the zone: Reduced beta power predicts baseball batting performance. *Neuroscience Letters*, *868*: 150-154. **(PDF)**

Howse, A., Hassall, C. D., **Williams, C. C.**, Hajcak, G., & Krigolson, O. E. (2018). Alcohol Hangover Impacts Learning and Reward Processing Within the Medial-Frontal Cortex. *Psychophysiology, e13081.* **(PDF)**

Williams, C. C., Hassall, C. D., Trska, R., Holroyd, C. B., & Krigolson, O. E. (2017). When Theory and Biology Differ: The Relationship Between Reward Prediction Errors and Expectancy. *Biological Psychology, 129*: 265-272. **(PDF)**

Krigolson, O. E., **Williams, C. C.**, & Colino, F. L. (2017). Using Portable EEG to Assess Human Visual Attention. In *International Conference on Augmented Cognition* (pp. 56-65). **(PDF)**

Krigolson, O. E., **Williams, C. C.**, Norton, A., Hassall, C. D., & Colino, F. L. (2017). Choosing MUSE: Validation of a Low-Cost, Portable EEG System for ERP Research. *Frontiers in Neuroscience*, *11*. **(PDF)**

Hassall, C. D., & **Williams, C. C.** (2017). The Role of the Amygdala in Value-Based Learning. *Journal of Neuroscience (Journal Club, non-refereed), 37*(28): 6601-6602. **(PDF)**

Williams, C. C., Saffer, B. Y., McCulloch, R. B., & Krigolson, O. E. (2016). The Scarcity Heuristic Impacts Reward Processing Within Medial-Frontal Cortex. *NeuroReport, 27*(7). **(PDF)**

PUBLISHED SOFTWARE (Total: 3 open-source Python packages)

EEG-GAN [Documentation]

Team Leader

Open-source Python package that generates synthetic EEG using AI (generative adversarial networks) to augment training data for classifiers.

***Package in research**:*

Williams, Weinhardt et al., 2023, *Yi, et al., 2024*

***Equation-Scraper* [Documentation]**

Team Leader

Open-source Python package that scrapes Wikipedia for mathematical equations, parses them into components to build detailed priors, and provides tools for equation discovery and broader modeling applications.

Package in research:

Hewson et al., 2023, *Marinescu et al., 2023*

***AutoRA (Automated Research Assistant)* [Documentation]**

Developer

Open-source Python framework for automating multiple stages of the empirical research process, including model discovery, experimental design, data collection, and documentation for open science.

Package in research:

Musslick et al., 2024, *Hewson et al., 2023*, *Musslick et al., 2023*