Jennifer Williams

Curriculum Vitae

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Publications

Conference Proceedings	**Same cause; different effects in the brain.** M. Toneva*, **J. Williams***, A. Bollu, C. Dann, L. Wehbe. *Causal Learning and Reasoning*, CLeaR 2022
Preprints	**Behavior measures are predicted by how information is encoded in an individual's brain.** **J. Williams**, L. Wehbe. arXiv 2021 (arXiv:2112.06048)
	Discriminative subtyping of lung cancers from histopathology images via contextual deep Learning. B.J. Lengerich, M. Al-Shedivat, A. Alavi, **J. Williams**, S. Labbaki, E.P. Xing. *medRxiv* 2020 (DOI: 10.1101/2020.06.25.20140053)
Journal Papers	**LSD1 dual function in mediating epigenetic corruption of the vitamin D signaling in prostate cancer.** S. Battaglia, E. Karasik, B. Gillard, **J. Williams**, T. Winchester, M.T. Moser, D.J. Smiraglia, B.A. Foster. *Clinical Epigenetics* 2017 (DOI: 10.1186/s13148-017-0382-y)

Education

Expected 2022	**PhD in Computational Biology**, Carnegie Mellon University (CMU). Advisor: Dr. Leila Wehbe, Machine Learning Department Topic: Machine Learning Method Development to Model Individual Differences in the Brain in the Presence and Absence of Disease
2013-2016	**Cancer and Systems Biology EU-USA Atlantis Dual Degree Program**. ■ **Master of Science in Natural Science**, Roswell Park, University at Buffalo. Advisor: Dr. Barbara Foster Topic: Computational and Experimental Interrogation of Vitamin D's Role in Prostate Cancer ■ **Master of Science in Integrated Systems Biology**, University of Luxembourg. ■ **Courses Towards MSc**, University of Amsterdam and VU University Amsterdam.
2013	**Bachelor of Science in Biology**, Canisius College. Magna Cum Laude.

Relevant PhD Coursework and Computing Skills

Languages	Python, R, MATLAB, Java, LaTeX
Libraries	Scikit-learn, Pandas, NumPy, Pycortex
Courses	Cognitive Neuroscience, Machine Learning, ABCDE of Statistical Methods in Machine Learning, Intermediate Statistics, Probabilistic Graphical Models, Computational Medicine

Fellowships

2020-2021	Digital Health Fellowship - Center for Machine Learning and Health (CMLH) ■ Full tuition and stipend for 12 months and $3,000 for research-related expenses
2017-2019	NIH T32 Training Grant - National Institute of Biomedical Imaging and Bioengineering ■ Full tuition and stipend for 2 years and $6,000 for research-related expenses

2013-2015	CanSys MS Scholarship - Atlantis EU-USA Training Program
	▪ Stipend for 12 months
2012-2013	Canisius Earning Excellence Program (CEEP) Research Grant

Current Research Projects

Graduate Research Assistant - CMU

Predicting Behavior From How Information is Encoded in an Individual's Brain.

- ▪ Creating a framework to identify individual differences in how information is encoded in the brain, and testing if these differences predict behavior measures. Utilizing functional connectivity methods and encoding/decoding models with visual and language semantic features to analyze neuroimaging data.

Creating Interpretable Integrated Analysis of Imaging and Genomic Data.

- ▪ Collaborating with a cross-functional team to develop a deep learning framework to incorporate complex covariate data (e.g. histology images) into an interpretable graphical model framework.

Discovering How Individual Differences in a Stroke Impact Vision Recovery.

- ▪ Extending causal mediation methods to model how fMRI activity and a stroke lesion impact a participant's visual field recovery.

Identifying Individual Brain Differences in Healthy and Depressed Participants.

- ▪ Developing algorithms to model individual differences in time series fMRI or EEG data elicited by naturalistic stimuli (audio and videos) that are clinically relevant.

Conference Posters and Oral Presentations

2021	**Behavior Measures are Predicted by How Information is Encoded in an Individual's Brain.** Neuromatch Conference 4 (NMC4), poster
2021	**Leveraging Brain Encoding Models to Predict Individual Differences in Behavior.** Society for Neuroscience (SFN), poster
2019	**All Terrain Graph-Learner-CPC: Causal Model Discovery for Missing Not at Random Data.** ISMB/ECCB (Intelligent Systems for Molecular Biology/European Conference on Computational Biology), poster
2018	**Contextual Explanation Networks Enable Integrated Analysis of Imaging and Genomic Data.** ISMB, poster
2018	**Learning Causal Models from Missing Not at Random Data in Clinical Datasets.** NIH Training Grantees Meeting of the National Institute of Biomedical Imaging and Bioengineering, poster
2013	**Preliminary Results on the Prevalence of Physiology Students' Homeostatic Misconceptions.** Experimental Biology (EB) poster
2012	**Mentoring: A Collaboration Between Higher Education and Urban After School Outreach Programs.** Science Teachers Association of New York State Conference (STANYS), oral presentation

Awards

2021	Top Reviewer Machine Learning for Health (ML4H) Conference
	▪ Top 10 reviewer out of several hundred
2019	Attended 2019 Machine Learning Summer School (MLSS) Moscow to collaborate and learn state of the art techniques to advance machine learning research
2019	Carnegie Mellon University Graduate Student Assembly/Provost Conference Award

2019	International Conference on Machine Learning (ICML) Travel Award
2018	CMU-Pitt Computational Biology (CPCB) PhD Program Student Service Award
2013	Canisius College Biology Department Excellence in Science Education Award
2012	Beta Beta Beta (Biological Honor Society - National Inductee)

Selected Previous Research Experiences

Graduate Research Assistant - CMU

Extending Causal Model Discovery for Missing Not at Random Data (MNAR).

- Proposed, developed and implemented a causal learning algorithm to learn a causal graph when data is MNAR.

Graduate Research Assistant - Roswell Park

Interrogated Vitamin D's Role in Prostate Cancer.

- Profiled the vitamin D receptor and lysine-specific demethylase 1 (LSD1) interactomes using Prostate Cancer clinical samples and data I collected from cell lines and mice.
- Thesis published by ProQuest, "Inhibiting LSD1 restores vitamin D responsiveness in castration resistant prostate cancer", 2016.

Relevant Service and Leadership

2021-present	**BrAIn Seminar Co-organizer**. Co-organized a weekly seminar at the intersection of neuroscience and AI research
2021-present	**CPCB Steering Committee Student Representative**. Collaborated with senior leadership in the CPCB PhD program to decide strategic priorities
2018-present	**Peer Reviewer**. ML4H Conference 2021 New In ML @NeurIPS Workshop 2020-2021 Nature Scientific Reports European Conference on Computational Biology (ECCB) 2018
2016-present	**TechNights Volunteer**. Created and led workshop on image processing for middle school girls Assisted teaching other STEM topics through interactive workshops
2020	**Graduate Application Support Program Mentor**. Provided feedback to potential CMU PhD program applicants
2017-2020	**CPCB Graduate Student Assembly**. President (2019-2020) Vice President (2018-2019) Senator (2017-2018)
2017-2019	**TECBio REU (Training and Experimentation In Computational Biology Research Experiences for Undergraduates)**. Co-led a journal club for undergraduate researchers (2019) Ethics mentor for undergraduate researchers (2018) Moderated a journal club for undergraduate researchers (2017 - 2018)
2019	**Convestro Pittsburgh Regional Science & Engineering Fair Judge**. Leader of a 5 judge team in Medicine, Health, and Microbiology category
2018-2019	**Admissions Committee Member CPCB PhD program**. Reviewed PhD program applications and assisted making admissions decisions
2018	**Intel International Science and Engineering Fair (ISEF) Grand Award Judge**.

Teaching and Mentoring

2019-2020   **Mentored Undergraduate Student**.
William Yang - CMU Computer Science

2017-2018   **Teaching Assistant**, *Carnegie Mellon University*.
Course: Lab Methods for Computational Biologists.
Planned and taught module on computational sequence analysis