ANGELA **TAM**

DATA SCIENTIST

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About

A data scientist with expertise in developing prognostic neuroimaging biomarkers for neurodegenerative diseases. Believes in practicing open science and sharing open source software to advance discoveries.

Experience

Senior Scientist & Software Developer

Perceiv AI

2019 – Present Montreal, Canada

- Developed patient selection tools for clinical trials by pairing biomedical data and machine learning
- Coded pipelines that aggregated, cleaned, and processed large-scale datasets containing imaging, genetic, and clinical information
- Designed brain imaging processing pipelines to extract relevant features and implemented quality control procedures
- Containerized software for deployment on cloud computing services
- Led precision medicine research that aimed to predict individuals at high-risk of neurodegenerative diseases and presented original findings in scientific journals and conferences
- https://perceiv.ai/

Postdoctoral Research Fellow

National University of Singapore

2018 – 2020 Singapore

- Advisor: B. T. Thomas Yeo
- Project: Shared and unique brain network features predict cognition, personality and mental health in childhood
- Used neuroimaging features derived from functional magnetic resonance imaging to predict cognition and psychiatric symptoms in a large-scale dataset with kernel ridge regression

Graduate Student Researcher

Centre de recherche de l'Institut universitaire de gériatrie de Montréal

2013 – 2018 Montreal, Canada

- Processed brain images acquired with structural and functional magnetic resonance imaging and trained machine learning models (e.g. support vector machine, logistic regression, random forest) to predict Alzheimer's disease dementia
- Contributed to the development of an open source neuroimaging pipeline: NeuroImaging Analysis Kit

Instructor

Montreal Brainhack School

2018 Montreal, Canada

- Prepared and presented live demonstrations of data science packages (pandas, scikit-learn) and neuroimaging resources
- Debugged problems with students in on-demand one-on-one sessions
- https://brainhackmtl.github.io/school2018/

Education

Ph.D. in Neuroscience

McGill University

2013 – 2018 Montreal, Canada

- Advisors: Pierre Bellec & John Breitner
- Thesis: Predicting Alzheimer's dementia from heterogeneous patterns of neurodegeneration and functional connectivity
- Keywords: neuroimaging, brain networks, machine learning, prediction, biomarker development, neurodegenerative disease

M.Sc. in Neuroscience

Queen's University

2011 – 2013 Kingston, Canada

- Advisor: Angeles Garcia
- Thesis: Neuroimaging attentional control in the Stroop task
- Keywords: cognition, neuroimaging, aging

B.Sc. in Psychology

University of Ottawa

2007 – 2011 Ottawa, Canada

- Magna Cum Laude
- Advisor: Patrick Davidson
- Thesis: The effects of aging and sleep quality on location and distance-based processes in memory for when something happened

Skills

git/GitHub | Python | Jupyter | R | MATLAB | Octave | Bash | AWS | HTML | LaTeX | Docker | Unix/Linux

big data | neuroimaging | MRI | fMRI | scientific software development | scientific research | scientific writing | data visualization | data wrangling | data mining | machine learning

Languages

English
French
Cantonese

Publications

1. *Chen, J., ***Tam, A.**, Kebets, V., Orban, C., Ooi, L. Q. R., Marek, S., *et al.* Shared and unique brain network features predict cognition, personality and mental health in childhood. *Nature Communications* (2021 (Accepted)).
2. **Tam, A**, Laurent, C., Gauthier, S. & Dansereau, C. Prediction of cognitive decline for enrichment of Alzheimer's disease clinical trials. *arXiv preprint arXiv:2111.04174*. https://arxiv.org/abs/2111.04174 (2021).
3. Urchs, S. G., Nguyen, H. D., Moreau, C., Dansereau, C., **Tam, A.**, Evans, A. C. & Bellec, P. Reproducible functional connectivity endophenotype confers high risk of ASD diagnosis in a subset of individuals. *BioRxiv*. doi:10.1101/2020.06.01.127688 (2020).
4. Urchs, S. G., **Tam, A.**, Orban, P., Moreau, C., Benhajali, Y., Nguyen, H. D., Evans, A. C. & Bellec, P. Subtypes of functional connectivity associate robustly with ASD diagnosis. *BioRxiv*. doi:10.1101/2020.04.14.040576 (2020).
5. **Tam, A.**, Dansereau, C., Iturria-Medina, Y., Urchs, S., Orban, P., Sharmarke, H., *et al.* A highly predictive signature of cognition and brain atrophy for progression to Alzheimer's dementia. *GigaScience* **8.** doi:10.1093/gigascience/giz055 (2019).
6. Vogel, J. W., Vachon-Presseau, E., Pichet Binette, A., **Tam, A.**, Orban, P., Joie, R. L., *et al.* Brain properties predict proximity to symptom onset in sporadic Alzheimer's disease. *Brain* **141,** 1871–1883. doi:10.1093/brain/awy093 (2018).
7. Badhwar, A., **Tam, A.**, Dansereau, C., Orban, P., Hoffstaedter, F. & Bellec, P. Resting-state network dysfunction in Alzheimer's disease: A systematic review and meta-analysis. *Alzheimer's & Dementia: Diagnosis, Assessment & Disease Monitoring* **8,** 73–85. doi:10.1016/j.dadm.2017.03.007 (2017).
8. Dansereau, C., **Tam, A.**, Badhwar, A., Urchs, S., Orban, P., Rosa-Neto, P. & Bellec, P. A brain signature highly predictive of future progression to Alzheimer's dementia. *arXiv preprint arXiv:1712.08058*. https://arxiv.org/abs/1712.08058 (2017).
9. Orban, P., **Tam, A.**, Urchs, S., Savard, M., Madjar, C., Badhwar, A., *et al.* Subtypes of functional brain connectivity as early markers of neurodegeneration in Alzheimer's disease. *bioRxiv,* 195164. doi:10.1101/195164 (2017).
10. Reginold, W., Itorralba, J., **Tam, A.**, Luedke, A. C., Fernandez-Ruiz, J., Reginold, J., Islam, O. & Garcia, A. Correlating quantitative tractography at 3T MRI and cognitive tests in healthy older adults. *Brain Imaging and Behavior* **10,** 1223–1230. doi:10.1007/s11682-015-9495-0 (2016).
11. **Tam, A.**, Dansereau, C., Badhwar, A., Orban, P., Belleville, S., Chertkow, H., *et al.* A dataset of multiresolution functional brain parcellations in an elderly population with no or mild cognitive impairment. *Data in Brief* **9,** 1122–1129. doi:10.1016/j.dib.2016.11.036 (2016).
12. Orban, P., Madjar, C., Savard, M., Dansereau, C., **Tam, A.**, Das, S., *et al.* Test-retest resting-state fMRI in healthy elderly persons with a family history of Alzheimer's disease. *Scientific Data* **2,** 1–11. doi:10.1038/sdata.2015.43 (2015).
13. Reginold, W., Luedke, A. C., **Tam, A.**, Itorralba, J., Fernandez-Ruiz, J., Reginold, J., Islam, O. & Garcia, A. Cognitive Function and 3-Tesla Magnetic Resonance Imaging Tractography of White Matter Hyperintensities in Elderly Persons. *Dementia and geriatric cognitive disorders extra* **5,** 387–394. doi:10.1159/000439045 (2015).
14. **Tam, A.**, Dansereau, C., Badhwar, A., Orban, P., Belleville, S., Chertkow, H., *et al.* Common Effects of Amnestic Mild Cognitive Impairment on Resting-State Connectivity Across Four Independent Studies. *Frontiers in Aging Neuroscience* **7,** 2214–2266. doi:10.3389/fnagi.2015.00242 (2015).
15. **Tam, A.**, Luedke, A. C., Walsh, J. J., Fernandez-Ruiz, J. & Garcia, A. Effects of reaction time variability and age on brain activity during Stroop task performance. *Brain Imaging and Behavior* **9,** 609–618. doi:10.1007/s11682-014-9323-y (2015).
16. *Ruthirakuhan, M., *Luedke, A. C., ***Tam, A.**, Goel, A., Kurji, A. & Garcia, A. Use of physical and intellectual activities and socialization in the management of cognitive decline of aging and in dementia: A review. *Journal of Aging Research* **2012.** doi:10.1155/2012/384875 (2012).

* Authors contributed equally.