ANGELA **TAM**

DATA SCIENTIST

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About

A data scientist with expertise in developing prognostic neuroimaging biomarkers for neurodegenerative diseases and a passion for practicing open science.

Experience

Senior Scientist & Software Developer

Perceiv AI

2020 – Present Montreal, Canada

- Led precision medicine research that aimed to predict individuals at high-risk of neurodegenerative diseases (e.g. Alzheimer's disease) and cardiovascular issues (e.g. myocardial infarction, stroke, unstable angina)
- Published research in peer-reviewed scientific journals and presented talks and posters at conferences
- Developed software-as-a-service products for clinical decision support and clinical trial patient selection
- Coded pipelines that aggregated, cleaned, and harmonized large-scale datasets obtained from research consortia and clinical trials containing medical imaging, genetic, and clinical information
- Designed brain imaging processing pipelines and quality control procedures that can be implemented at scale
- Containerized software for deployment on cloud computing services
- Drafted applications for medical device approval from federal health agencies (e.g. US FDA)
- https://perceiv.ai/

Postdoctoral Research Fellow

National University of Singapore

2018 – 2020 Singapore

- Advisor: B. T. Thomas Yeo
- Processed medical images and tabular data (e.g. demographics, questionnaires) from a large multi-centre dataset in a developmental population (n = 11,000) for scientific research
- Used neuroimaging features derived from functional magnetic resonance imaging to predict cognition, personality traits, and mental health symptoms with machine learning techniques (e.g. kernel ridge regression)
- Provided mentorship to PhD students

Graduate Student Researcher

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

2013 – 2018 Montreal, Canada

- Trained machine learning models (e.g. support vector machine, logistic regression, random forest) on brain MRI scans to predict Alzheimer's disease dementia
- Contributed to the development of an open source neuroimaging pipeline: NeuroImaging Analysis Kit

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

Selected 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 in the ABCD study. *Nature Communications* **13.** doi:10.1038/s41467-022-29766-8 (2022).
2. Li, J., Bzdok, D., Chen, J., **Tam, A.**, Ooi, L. Q. R., Holmes, A. J., *et al.* Cross-ethnicity/race generalization failure of behavioral prediction from resting-state functional connectivity. *Science Advances* **8,** eabj1812. doi:10.1126/sciadv.abj1812 (2022).
3. Marek, S., Tervo-Clemmens, B., Calabro, F. J. & others including **Tam, A.**, Reproducible brain-wide association studies require thousands of individuals. *Nature* **603,** 654–660. doi:10.1038/s41586-022-04492-9 (2022).
4. Ooi, L. Q. R., Chen, J., Zhang, S., Kong, R., **Tam, A.**, Li, J., *et al.* Comparison of individualized behavioral predictions across anatomical, diffusion and functional connectivity MRI. *NeuroImage* **263,** 119636. doi:10.1016/j.neuroimage.2022.119636 (2022).
5. **Tam, A.**, Laurent, C., Gauthier, S. & Dansereau, C. Prediction of Cognitive Decline for Enrichment of Alzheimer's Disease Clinical Trials. *The Journal of Prevention of Alzheimer's Disease,* 1–10. doi:10.14283/jpad.2022.49 (2022).
6. Urchs, S. G., **Tam, A.**, Orban, P., Moreau, C., Benhajali, Y., Nguyen, H. D., Evans, A. C. & Bellec, P. Functional connectivity subtypes associate robustly with ASD diagnosis. *Elife* **11,** e56257. doi:10.7554/eLife.56257 (2022).
7. **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).
8. 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).
9. 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).
10. **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).
11. 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).
12. **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).
13. **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).
14. *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.