DIMUTHU HEMACHANDRA

Palo Alto, California, USA.
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SUMMARY OF QUALIFICATIONS:

Dynamic researcher with over 10 years of experience in scientific research, specializing in image analysis using MRI (both functional and structural) and PET. Proficient in building data processing pipelines and applying advanced machine learning and deep learning techniques to analyze large datasets using high-performance computing clusters. Background in Biomedical Engineering and Astrophysics, complemented by 9+ years of university-level teaching experience.

EDUCATION

Ph.D. in Biomedical Engineering *May 2018 - August 2023*
Western University,London,Ontario,Canada

Certificate in Curriculum, Teaching and Learning in the STEM *Jan. 2022 - July 2022*
Faculty of Engineering, Western University, London, Ontario, Canada

Master of Science in Astrophysics *Sep. 2012 -April 2014*
Western University,London,Ontario,Canada

Bachelor of Science in Physics *May 2007 - Sep. 2011*
Minors : Mathematics, Computer Science
The University of Peradeniya, Sri Lanka

PROFESSIONAL EXPERIENCE

Post Doctoral Research Fellow,
Dept. of Neurology and Neurological Sciences, Stanford University, California *Jan. 2024 - Present*

- Building automated pipelines to study the brain waste clearance system using MRI and AI.
- Collaborating with Stanford Research Institute (SRI) International to analyze MRI data to study sleep related neuro-degeneration.
- Helping restructuring, standardizing of data and processing pipelines to improve reproducibility and data sharing.

Research Assistant , *Robarts Research Institute, London, Ontario* *2018 - Present*

- Developed tools to detect Parkinson's Disease at it's early stages using MRI data combined with machine learning techniques, with an accuracy over 90%
- Handled large amount of open source data collected across the world using advanced super computers to develop pipelines to process data efficiently and accurately.

Graduate Teaching Assistant, *Western University,London,Ontario,Canada* *2012 - present*

- Developed excellent communication and presentation skills by teaching and demonstrating scientific concepts and experiments for groups of 40+ undergraduates.

Research Assistant,TRIUMF Canada
Canada's national laboratory for particle and nuclear physics *Fall - 2014*

- Worked on instrumentation of the EMMA (Electro-Magnetic Mass Analyzer) project which is developed to measure the mass of subatomic particles which are produced from nuclear reactions.
- Gained experience in working at a nuclear laboratory and to use radioactive materials in experiments while following safety procedures and health regulations..

Research Assistant, *Western University,London,Ontario,Canada* *2012 - 2015*

- Analyzed large amount of data gathered from space based telescopes using high level programming languages and fitted statistical models to those data.
- Collaborated with research groups and professors as a team to manage multiple tasks and to achieve time sensitive goals.

TECHNICAL STRENGTHS

Operating Systems:	Windows, OS X,Linux
Programming:	Python, Shell Scripting, Java, Matlab
Software & Packages:	Ms Excel and other Office packages, High Performance Computing (HPC)
Tools in Neuroimaging:	FSL, MRtrix, FreeSurfer, ANTS, nilearn, NiBabel, Workbench, Nipype

PUBLICATIONS

Articles published in peer-reviewed journals:

Alushaj, E., **Hemachandra, D.**, Ganjavi, H., Seergobin, K. N., Sharma, M., Kashgari, A., Barr, J., Reisman, W., Khan, A. R., & MacDonald, P. A. (2024). Increased mean diffusivity of the caudal motor SNc identifies patients with REM sleep behaviour disorder and Parkinson's disease. NPJ Parkinson's Disease, 10(1), 128.

Alushaj E, **Hemachandra, D.**, Alan Kuurstra, Ravi S. Menon, .., Ali R. Khan, Penny A. MacDonald (2023) . "Subregional analysis of striatum iron in Parkinson's disease and rapid eye movement sleep behaviour disorder " Journal of NeuroImage. Volume 40, 2023, 103519

Taha, A., Gilmore, G., Abbass, M., Kai, J., Kuehn, T., Demarco, J., ... **Hemachandra, D.**, et al. (2022). "Magnetic resonance imaging datasets with anatomical fiducials for quality control and registration". Preprint accepted in Nature Science. doi: 10.1101/2022.11.21.516173

Y. Xiao, J. C. Lau, **Hemachandra, D.**, G. Gilmore, A. R. Khan and T. M. Peters, "Image Guidance in Deep Brain Stimulation Surgery to Treat Parkinson's Disease: A Comprehensive Review," in IEEE Transactions on Biomedical Engineering, vol. 68, no. 3, pp. 1024-1033, March 2021.

Maragkoudakis, A., Ivkovich, N., Peeters, E., Stock, D. J., **Hemachandra, D.**, A.G.G.M. Tielens. (2018). "PAHs and star formation in the HII regions of nearby galaxies M83 and M33", Monthly Notices of the Royal Astronomical Society, 481: 5370–5393

Hemachandra, D.*, Barmby, P., Peeters, E., Willner, S.P., Ashby, M.L.N., Smith, H.A., Gordon, K.D., Smith, D.A., Fazio, G.G. (2015). "Mid-infrared spectroscopy of the Andromeda galaxy", Monthly Notices of the Royal Astronomical Society. 454: 818-830

Other peer-reviewed contributions:

Hemachandra, D.*, Younes, K., Müller-Oehring, E. (2024). "MRI visible perivascular spaces are associated with years since diagnosis and symptom severity in Parkinson's disease", Movement Disorders Society Congress (MDS) conference, Philadelphia, USA, (Poster)

Hemachandra, D.*, MacDonald, P., Khan, A. (2022). "Prediction of early-stage Parkinson's disease using connectivity and morphometry of the striatum", Movement Disorders Society Congress (MDS) conference, Madrid, Spain, (Talk)

Hemachandra, D.*, MacDonald, P., Khan, A. (2022). "Tracking disease progression in Parkinson's Disease using striato-cortical gradients", Imagining Network Ontario (ImNO) conference, Toronto, Canada, (Talk)

Hemachandra, D.*, MacDonald, P., Khan, A. (2019). "Structural connectivity biomarkers for Parkinson's disease", Organization for Human Brain Mapping (OHBM) conference, Glasgow, Scotland, (Poster)

Hemachandra, D.*, MacDonald, P., Khan, A. (2019). "Structural connectivity biomarkers for Parkinson's disease", Organization for Human Brain Mapping (OHBM) conference, Rome, Italy, (Poster)

SCHOLARSHIPS AND AWARDS

•**NSERC- Doctoral Award** *2019 - present*
Natural Sciences and Engineering Research Council, Canada
•**Ontario Graduate Scholarship(OGS)** *2019*
Ontario Graduate Scholarship, Canada
•**Dean's Honor Roll of Teaching** *2016 - 2017*
Brescia University College, London, Ontario, Canada
•**STEM Teaching Certificate Award** *2021 - 2022*
University of Western Ontario, Canada
•**Travel Award (MDS Congress, Madrid)** *June 2019*
Organization for Human Brain Mapping
•**Travel Award (OHBM conference, Rome)** *June 2019*
Organization for Human Brain Mapping
•**Western Graduate Research Scholarship(WGRS)** *2018 - present*
Western University, London, Ontario, Canada

PROFESSIONAL DEVELOPMENT

Mentor of Science Small Groups (SSG) - 10-week course at Stanford *Summer 2024*

• Mentored a group of community college students in the 10-week Science Small Groups (SSG) course, fostering their interest in scientific concepts and the scientific method. Guided students in developing their curiosity and creativity through meaningful questions and thoughtful experiments, resulting in significant growth and achievement throughout the program.

Preparing for Faculty Careers (PFC) - 10-week course at Stanford *Summer 2024*

• Completed the 10-week Preparing for Faculty Careers course at Stanford University, designed for postdocs aiming for academic careers. Engaged in sessions focused on identifying career fit, mastering the application and interview process, and preparing for success as a faculty member.

Neuromatch Academy - 3-week course in Deep Learning (NMA-DL) *July 2021*

• Completed an intensive and interactive 3-week course on deep learning as part of the Neuromatch Academy. Collaborated with an international group of participants to enhance understanding and application of deep learning techniques. Developed a music generative AI model, contributing to the creation of a new music genre.

International High Performance Comuping (HPC) Summer School *Summer 2021*

• Participated in the International 2-week Summer School on HPC Challenges in Computational Sciences in 2021. Gained comprehensive knowledge of high-performance computing and its applications across various disciplines.

Brainhack Events and Workshops *2019 - 2022*

• Attended several Brainhack events globally and locally, including collaborative workshops that bridge the data science and neuroscience research communities. Engaged in open collaboration and interdisciplinary teamwork to address complex questions in neuroscience. Contributed to innovative projects utilizing computational techniques to solve problems in neuroscience. Organized local Brainhack workshops to foster regional collaboration and knowledge exchange.

How to Change the World -*United Nations Experiential Education Program* *Summer 2021*

• Participated in a four-day experiential education program organized by the United Nations, focused on addressing real-world sustainability and innovation challenges. Received a certificate for the proposed sustainability project aimed at improving CO2 emissions in the city of Bologna, Italy. Collaborated with individuals from diverse backgrounds, leveraging collective expertise for impactful solutions.

PUBLIC OUTREACH

Main organizer of the Brainhack computational workshop.
Western University, London, Ontario, Canada *Fall - 2021*

Organized a weekly tutorial series for computational neuro-imaging.
Robarts Research Institute, London, Ontario, Canada *Fall - 2019*

Conducted a public awareness talk series about research works on Parkinson's Disease.
Robarts Research Institute, London, Ontario, Canada *June - 2019*

Member of the organizing committee of the Brainhack computational workshop.
Western University, London, Ontario, Canada *Fall - 2019*

Examiner, London District Science Olympics *May. - 2019*
Western University, London, Ontario, Canada

Judge, Thames Valley Science Engineering Fair *April - 2019*
Western University, London, Ontario, Canada

Examiner, Canadian Association of Physics (CAP) University Prize Exam *Feb. - 2014*
Western University, London, Ontario, Canada