Anas Zainul Abidin

+1(585)-967-8184 | anas.abidin@rochester.edu
web : https://anaszain89.github.io/

EDUCATION

Ph.D. in **Biomedical Engineering**, Medical Image Analysis — August 2013 - Present
Hajim School of Engineering and Applied Sciences at University of Rochester, Rochester, NY
Thesis: A computational framework for development of imaging-derived biomarkers for HIV Associated Neurocognitive Disorders using functional-MRI

Masters in Science in **Biomedical Engineering** — August 2013 – April 2015
Hajim School of Engineering and Applied Sciences at University of Rochester, Rochester, NY

Bachelors of Engineering in **Biomedical Engineering** — August 2006 - June 2010
Manipal Institute of Technology, Manipal, India

RESEARCH PROJECTS

Time-Series Analysis and Statistics (MATLAB, FSL, Shell Scripting)

- **Quantitative Imaging biomarkers for neurological disorders using functional MRI**
  - *Conceptualized and developed* end-to-end software framework for *non-linear functional connectivity* estimation from resting state fMRI data.
  - Developed tools for *graph theoretic* and *statistical analysis* of brain *network* data.

Image Characterization and Machine Learning (Python - Numpy, Pandas, sci-kit learn, Pytorch etc.)

- **Phase Contrast CT image classification**
  - Developed methods for patellar cartilage *characterization* from Phase-contrast CT images and their subsequent *classification* of osteoarthritic samples using *machine learning*.
- **Localization and heterogeneity characterization of brain tumors**
  - Developed a system for *localization* and *segmentation* of glioblastomas (BRATS 2017 Challenge).
  - Implemented tools for identifying *quantitative prognostic phenotypes* of different brain tumors (metastatic vs glioblastomas).
- **Multi-class chest pathology classification from X-ray imaging**
  - Implemented a *deep-learning* based *framework* with parametric modifications for enhanced training, producing state-of-the-art results for multiple pathologies.
- **Natural language processing of radiology reports**
  - Ongoing project for developing a *recurrent neural network* based approach for *language modelling* of radiology reports for predicting positive/negative findings.

Structured Data Analysis with Machine Learning (Python – Pandas, sci-kit learn, Pytorch etc.)

- **Machine learning on health records data**
  - Developed tools for hackathon to predict hospital readmissions using *dimension reduction*, *enhanced feature representation* and random forest classifier. Also, implemented a convolutional neural networks (CNN) based approach using *entity embeddings* and additional *feature engineering* for fine-grained classification.

TECHNICAL SKILLS AND INTERESTS

- Python (NumPy, scikit-learn, Pandas, PyTorch, Tensorflow), MATLAB, Shell-scripting, C, LabVIEW
- Deep Learning, Machine Learning, Image & Signal Processing, Statistical Analysis, MR Imaging, Graph Theory

WORK EXPERIENCE

Philips Electronics India Ltd. - Field Service Engineer — September 2010 - April 2013

- Radiology Imaging Systems Engineer with specialization in Magnetic Resonance Imaging (MRI)
- Technical Training in operating MRI Systems ACHIEVA R2/3, Part 1 at SLC, Singapore
- Lead Engineer for installation of 5 MRI systems
- Delivered customer support, breakdown management, planned maintenance, and helium fillings for 22 MRI systems

Manipal Hospital, India - Biomedical Engineer — June - July 2009

- Worked as a part of biomedical engineering team at the hospital. Provided support in repair and maintenance of various medical devices ranging from bedside patient monitors to anesthesia, dialysis and X-ray machines

SELECTED PUBLICATIONS

Journals

- **Abidin AZ**, DSouza AM, Nagarajan MB, Qiu X, Schifitto G, Wismüller A. Alteration of brain network topology in HIV-associated neurocognitive disorder: A novel functional connectivity perspective. NeuroImage: Clinical. 2018;17:768-77.
- **Abidin AZ**, Deng B, DSouza AM, Nagarajan MB, Coan P, Wismüller A. Deep transfer learning for characterizing chondrocyte patterns in phase contrast X-Ray computed tomography images of the human patellar cartilage. Computers in biology and medicine. 2018;95:24-33.
- DSouza AM, **Abidin, AZ**, Chockanathan U., Schifitto G., & Wismüller A. (2018). Mutual connectivity analysis of resting-state functional MRI data with local models. NeuroImage. 2018; 178:210-223.
- DSouza AM, **Abidin AZ**, Leistritz L, Wismueller A. Exploring connectivity with large-scale Granger causality on resting-state functional MRI. Journal of neuroscience methods. 2017;287:68-79.

Peer-Reviewed Conferences

- **Abidin AZ,** D'Souza AM, Chockanathan U, Schifitto G, Wismüller A. Investigating directed functional connectivity between the resting state networks of the human brain using mutual connectivity analysis. Medical Imaging 2018: International Society for Optics and Photonics.
- **Abidin AZ**, Jameson J, Molthen R, Wismüller A. Classification of micro-CT images using 3D characterization of bone canal patterns in human osteogenesis imperfecta. Medical Imaging 2017: Computer-Aided Diagnosis; 2017: International Society for Optics and Photonics.
- Wismüller A, **Abidin AZ**, DSouza AM, Nagarajan MB. Mutual connectivity analysis (MCA) for nonlinear functional connectivity network recovery in the human brain using convergent cross-mapping and non-metric clustering. Advances in Self-Organizing Maps and Learning Vector Quantization: Springer, Cham; 2016. p. 217-26.

HONOURS AND AWARDS

- **Winner**, Annual RocHackHealth Hackathon for developing a system to predict re-admissions of patients to the hospital within 30 days after discharge using medical records data, held at University of Rochester, 2016.
- **Multiple awards** for outstanding contribution during tenure at Philips Healthcare.
  - Your Contribution Counts (YCC)- awarded to engineers for solving major technical issues on field across country
  - SPOT awards for excellent execution of installation projects or timely problem resolution, within territory
- **Best Poster Award** - Honorable mention, Biomedical, Structural and Functional Imaging **SPIE Medical Imaging** '15
  - Investigating the use of mutual information and non-metric clustering for functional connectivity analysis on resting-state functional MRI.
- **Best Poster Award** - World AIDS Day Scientific Symposium organized by Centre for AIDS Research 2017.
  - Alteration of brain network topology in HIV-associated neurocognitive disorder: A novel connectivity perspective.
- **Best Teaching Assistant Award** - Department of Biomedical Engineering, for outstanding contribution in teaching as a Graduate Student 2014-2015
- **Rochester Center for Brain Imaging Pilot Award** (~10,000 USD) – awarded to team for the study of connectivity of the amygdala via the analysis of neuroimaging and anatomic tract tracing in non-human primates.

RELEVANT COURSEWORK

• Computer Vision • Machine Learning • Digital Image Processing • Medical Imaging • Digital Signal Processing MOOC • fastai – Deep Learning for Coders • Coursera – Deep Learning Specialization • Data Analysis with Python

LEADERSHIP AND ENTERPRENEURIAL EXPERIENCE

- Semifinalist in the Neuro Startup Challenge organized by The Center for Advancing Innovation – developed business and marketing plan for device which can be used for prospective motion correction during MR scanning.
- Served as Team Lead/Representative at various levels throughout academic and professional career.

PROFESSIONAL SERVICES

Reviewer – Medical Image Analysis, Neuroimage-Clinical, Magnetic Resonance Imaging, SPIE Journal of Medical Imaging, Proceedings of the National Academy of Sciences