Hanwen Bi

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EDUCATION

Columbia University **New York, NY**
M.S. in Biomedical Engineering Aug 2019 - Dec 2020

Northeastern University **Shenyang, CN**
B.E. in Biomedical Engineering Jun 2019
GPA: Overall 3.51/4.00; Major 3.67/4.00

RESEARCH EXPERIENCE

Columbia University **New York, NY**

Unravel developing infant brain network patterns with deep learning Sep 2020 - Present

Advisor: Andrew Laine, PhD, Professor of Biomedical Engineering
Jonathan Posner, MD, Professor of Psychiatry at CUMC
Position: Research Assistant
Responsibilities: -Projecting adult default mode network template to infant brain in different monthly period
-Adding an RNN to VAE to model the temporal dynamics of rs-fMRI
-Tracking and modelling infant brain pattern changes across the first few years of life in latent space

Intrapulmonary Lumen-wall Separation through DE-CT and Deep Learning Apr 2020 - Present

Advisor: Andrew Laine, PhD, Professor of Biomedical Engineering
R. Graham Barr, MD, PhD, Professor of Medicine at CUMC
Position: Research Assistant
Responsibilities: -Developing an automatic pipeline to separate lumen and wall on DECT scans through multi-material decomposition
-Utilizing domain adaptation and transfer learning, training a segmentation model on Non-contrast CT scans (or Virtual Non-contrast CT scans)
-Extracted vessel center line and optimized filter result (removed small vessel and disconnected component)

Whole Mouse Brain Neuron Structure and Connections analysis Oct 2019 - Feb 2020

Advisor: Andrew Laine, PhD, Professor of Department of Biomedical Engineering
Alex Dranovsky, MD, PhD, Assistant Professor of Psychiatry at CUMC
Position: Research Assistant
Responsibilities: -Enhanced the microscopic images of the mouse brain with advanced Vessel Filter, made the axon structure clearer for identification and reduced noises.

-Image registration and analyzed mouse brain connection changes by counting changes in the number of somas in the brain regions.

Neuromatch Academy

Predicting Working Memory Performance Based on Resting State fMRI Data Jul 2020

Advisor: Jeff Yau, PhD, Assistant Professor of Neuroscience, Baylor College of Medicine

Responsibilities:
-Made project proposal, developed research direction and data process pipeline, programed data preprocess
-Implemented Spectral Co-Clustering method to extract four subnetworks from the whole brain network
-Utilized a GLM model with L2 regularization to predict participants' performances from subnetworks

Northeastern University **Shenyang, CN**

Construction and Analysis of Functional Brain Network Based on Network Similarity Mar 2018 - Apr 2019

Lab: Medical Imaging and Intelligent Analysis Lab

Advisor: Yueyang Teng, PhD, Associate Professor of Biomedical Engineering

Position: Project leader of a three-person group

Responsibilities:
-Made project proposal, consulted references to keep up with the cutting-edge development, and coordinated routine work of members
-Preprocessed brain f-MRI imaging and constructed brain network with DPABI
-Successfully applied deep learning method of graph convolutional network to non-Euclidean data and obtained more comprehensive information of network for classification (AD/MCI/NC)

Course Project

Functional Brain Network Analysis Using Sparse Representation Methods Spring 2020

Course: ELENE6876 Sparse and Low-Dimensional Models for High-Dimensional Data

Lecture: John Wright, PhD, Associate professor of Electrical Engineering

Responsibilities:
-Successfully implemented the sparse subspace clustering method to reveal the relationship between different brain areas
-Utilized the robust principle content analysis method to extract information from the brain network to interpret the latent information

INTERNSHIP EXPERIENCE

Neusoft Group Inc., **Shenyang, CN**

Medical Image Management System Based on Android Jul 2017 - Aug 2017

Responsibility: Programmed app front-end interface and server, and decoded JSON data using Java

Product Function: User/doctor: to register/log in; Doctor: to upload/download images from the server

Modern Traffic Control System Jul 2016 - Aug 2016

Responsibility: Programmed image processing & analyzing module

Product Function: To read vehicle pictures and upload them to the server; to recognize license plate numbers and input them to the server

PROFESSIONAL AFFILIATION

OHBM Student Member 2019 - 2020

CONFERENCES/WORKSHOPS

OHBM 2020 Jun 2020
Neuromatch Academy 2020 (Interactive Track) Jul 2020

SKILLS

Programming: Python, Matlab
Frameworks & Tools: Pytorch, Keras, DPABI, Fiji (ImageJ), NeuroScope

SCHOLARSHIPS AND AWARDS

Northeast University Graduate Scholarship, Northeastern University 2018 - 2019
Scholarship for Outstanding Students, Northeastern University 2017 - 2018
Scholarship for Outstanding Students, Northeastern University 2016 - 2017
Scholarship for Outstanding Students, Northeastern University 2015 - 2016
2017 Outstanding Social Practice Report Award, Northeastern University 2017
2016 Outstanding Social Practice Individual Award, Northeastern University 2016

SOCIAL ACTIVITIES AND STUDENT WORK

Leader, 2017 Summer Social Practice for visiting Ansteel and studying Spirit Mengtai (a model worker characterized for his arduous struggle) 2017
Core Member, Winter Social Practice for enrollment promotion of Northeastern University 2016, 2017
Participant, Spring Sports Meeting of Northeastern University – Men's 1500m 2017
Player, Soccer Match of Northeastern University 2016, 2017
Leader, 2016 Daily Social Practice, investigating the industry situation and development prospect of BME major and visiting Neusoft Group Inc. 2016
Member, Department of Art of Student Union of BMIE College, Northeastern University 2015 - 2016

- Leader and Participant of Team Event & Jump Rope of Sports Meeting and coordinator of all team members for training
- Director of New Year's Day Party

Volunteer Teacher, Guangming Primary School and Luguan Primary School (twice a week) 2015 - 2016