

Hanwen Bi

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EDUCATION

Columbia University

M.S. in Biomedical Engineering

New York, NY

Aug 2019 - Dec 2020

Northeastern University

B.E. in Biomedical Engineering

GPA: Overall 3.51/4.00; Major 3.67/4.00

Shenyang, CN

Jun 2019

RESEARCH EXPERIENCE

Columbia University

New York, NY

Unravel developing infant brain network patterns with deep learning

Sep 2020 - Present

Lab: Heffner Biomedical Imaging Lab

Advisor: Andrew Laine, PhD, Professor of Biomedical Engineering

Jonathan Posner, MD, Professor of Psychiatry at CUMC

Position: Research Assistant

Responsibilities:

- Projecting adults 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

Intravascular Lumen-wall Separation through DE-CT and Deep Learning

Apr 2020 - Present

Lab: Heffner Biomedical Imaging Lab

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, train 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

Lab: Heffner Biomedical Imaging Lab

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 analyzing 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 Imaging

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)

Construction, Feature Extraction and Analysis of Brain Function Network

Mar 2017 - Mar 2018

Lab: Medical Imaging and Intelligent Analysis Lab

Advisor: Xuan He, PhD, Lecture, Department of Biomedical Informatics

Position: Core member of a five-person group

Responsibilities: -Read references about brain science and neuroimage

-Collected MRI data from ADNI database and used DPABI to preprocess data

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 2018 - Aug 2018
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 2017 - Aug 2017
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
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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

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