

ZIMING QIU

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EDUCATION

New York University

September 2017 - Present

PhD: Electrical Engineering (Supervised by Prof. Yao Wang)

Overall GPA: 3.83/4.0

Relevant Graduate Courses: Optimization, Data Structures and Algorithms, Natural Language Processing, Inference & Representation, Deep Learning, Advanced Machine Learning, Image & Video Processing, Linear Algebra, Probability & Stochastic Process, Digital Signal Processing.

Online: Convolutional Neural Networks for Visual Recognition (CS231n)

Beihang University

September 2013 - June 2017

Bachelor: Biomedical Engineering (Supervised by Prof. Yan Xu)

Overall GPA: 3.67/4.0

PUBLICATIONS

Journal Paper:

End-to-End Subtitle Detection and Recognition for Video in East Asian Languages via CNN Ensemble with Near-Human-Level Performance

- Yan Xu, Siyuan Shan, **Ziming Qiu**, Zhipeng Jia, Zhengyang Shen, Yipei Wang, Mengfei Shi, Eric I-Chao Chang. (Signal Processing: Image Communication, 2018, [paper link](#))

Integrated 3D Flow-based Multi-atlas Hippocampus Segmentation

- Yeshe Li, **Ziming Qiu**, Xianglong Liu, Eric I-Chao Chang, Yubo Fan, Zhuowen Tu, Yan Xu. (Neuroimage, under review, [preview link](#))

Conference Paper:

Automatic Body Localization and Brain Ventricle Segmentation in 3D High Frequency Ultrasound Images of Mouse Embryos

- Jen-wei Kuo, **Ziming Qiu**, Orlando Aristizabal, Jonathan Mamou, Daniel H. Turnbull, Jeffrey Ketterling, Yao Wang. (IEEE International Symposium on Biomedical Imaging (ISBI), 2018, [paper link](#))

Deep BV: A Fully Automated System for Brain Ventricle Localization and Segmentation in 3D Ultrasound Images of Embryonic Mice

- **Ziming Qiu**, Jack Langerman, Nitin Nair, Orlando Aristizabal, Jonathan Mamou, Daniel H. Turnbull, Jeffrey Ketterling, Yao Wang. (IEEE Signal Processing in Medicine and Biology (SPMB), 2018, [paper link](#))

RESEARCH EXPERIENCES

Automatic Brain Ventricle Localization and Segmentation in 3D Ultrasound Images of Mouse Embryos

September 2017 - Present

Graduate Research

- This project first uses nested graph cut and traditional machine learning methods to accomplish brain ventricle localization and segmentation in 3D ultrasound images of mouse embryos. We publish a conference paper for this method. Then more labeled data is available, we develop a deep learning algorithms to tackle the same problem and outperform our previous method by a large margin. We also submit a conference paper for it. This project is implemented with Python (Pytorch) and Matlab.

Integrated Flow-based Multi-atlas Hippocampus Segmentation July 2016 - September 2017
Undergraduate Research

- This project proposes a novel 3D registration algorithm, combining 3D SIFT flow and 3D optical flow, for multi-atlas-based hippocampus segmentation in MRI images. We achieve superior segmentation results and speed compared to existing methods and submit a journal paper to NeuroImage. This project is implemented with C++.

End-to-End Subtitle Detection and Recognition for Video in East Asian Languages via CNN Ensemble March 2016 - September 2016
Undergraduate Research

- This project develops a fully automatic video subtitle localization and recognition system customized for East Asian languages, achieving near-human-level performance. A CNN ensemble trained by synthetic data is used for character classification and its hidden layer features are extracted for subtitle localization. We submit a journal paper for this project. The codes of this project are written in Python.

3D Brain Image Segmentation Using 2D Fully Convolutional Neural Networks and Conditional Random Field October 2015 - March 2016
Undergraduate Research

- This project proposes a 3D brain image segmentation system using 2D fully convolutional neural networks and Conditional Random Field as post-processing. This project is implemented with Caffe and Python.

GRADUATE COURSE PROJECTS

Advanced Machine Learning: We conduct literature review and experiments on modern regularization techniques of deep neural networks, such as dropout, label smoothing, entropy penalty, multi-task training, network distillation and network ensemble.

Image & Video Processing: First, we conduct literature review from R-CNN, Fast R-CNN, Faster R-CNN to Mask R-CNN. Then, we develop a volumetric CNN to localize brain ventricle in 3D ultrasound images using sliding window. In the detected bounding box, we implement U-net structure network to segment brain ventricle.

Natural Language Processing: In this project we build neural machine translation systems for two parallel corpora, Chinese-English and Vietnamese-English. We implement and evaluate three models. The first one is a simple encoder-decoder model via GRU. Then we try to introduce attention mechanism in the decoder. Next, we attempt to replace the GRU encoder with a 1D CNN encoder.

Inference & Representation: In this project, we first try to use 2D DC-GAN and Wasserstein GAN with gradient penalty to generate ultrasound image slices of embryonic mice. Then, we extend the GANs models to 3D to generate image volumes directly.

PROFESSIONAL SKILLS

Research Interests	Computer Vision, Deep Learning, Medical Image Analysis
Programming Languages	Python, Matlab, C++, Latex
Libraries/Frameworks	Pytorch (frequently used), Tensorflow and Caffe (familiar)

HONORS

Ernst Weber Fellowship, NYU Tandon School of Engineering ECE Department