

# XIN WANG

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## EDUCATION

### Fudan University

Shanghai, P.R. China

B.Eng. in Electronic Engineering

Sept. 2016 – Jun. 2020

- Major GPA: 3.9/4.0 (top ~1.25%), Overall GPA: 3.8/4.0 (rank 4/84)
- GRE: 332 (V 162, Q 170) + 3.5, TOEFL: 109
- Selected Awards:
  - Top 10 Students in the School of Information Science and Technology (top 1.3% of ~760 students)
  - First Prize Scholarship in Fudan University (twice; top 3% of ~13,000 students)

## RESEARCH INTERESTS

My research interests include biomedical image analysis and machine learning, with an emphasis on diagnosis and disease prediction with respect to tomography and MRI. I also have great passion and research experience on probabilistic modeling, mathematical statistics, optimization, and traditional image processing algorithms.

## EXPERIENCE

### University of North Carolina at Chapel Hill (Department of Radiology)

Chapel Hill, USA

Summer Researcher under Professor Dinggang Shen

Jul. 2019 – Sept. 2019

#### Vertebra Localization and Segmentation

- Participated in a challenge set by MICCAI 2019, aiming to localize and segment 24 vertebrae from a limited number of 3D CT scans that involve various challenges such as scoliotic spines, metal insertions and highly restrictive FOVs
- Implemented a Single Shot MultiBox Detector, an object detection network, to detect the whole spine
- Implemented a Butterfly-like network, sagittal and coronal projections of CT scans as inputs, to localize vertebrae, with an identification rate of 83% on the validation set
- Implemented a 3D U-net to segment each vertebra according to the localization results, with a dice coefficient of 78% on the validation set
- Wrote canonical and compact deep learning programs using PyTorch (the code is now available on my GitHub page [github.com/lsDrizzle/Btrfly-Net-Pytorch](https://github.com/lsDrizzle/Btrfly-Net-Pytorch))
- Discussed with an author of a related paper, pointed out several mistakes in it, and received the author's acknowledgement

### Fudan University (Department of Electronic Engineering)

Shanghai, P.R. China

Research Assistant under Prof. Jinhua Yu, Biomedical Imaging Lab

Jun. 2018 – Jun. 2019

#### 3D Reconstruction of Angiography and Aneurysm Detection

- Trained in biomedical imaging and deep learning, including traditional image processing algorithms, machine learning and convolutional neural networks
- Used Filtered Back-projection and Simultaneous Iterative Reconstruction Technique (SIRT) to reconstruct 3D images of 2D angiography, and wrote a GUI application to visualize the results
- Implemented a Fully Convolutional Network, image registration algorithms and a Blob filter to detect aneurysms and estimate the risk of rupture

### Massachusetts Institute of Technology

Boston, USA

Member of Team Fudan-CHINA

Oct. 2018

#### International Genetically Engineered Machine Competition (iGEM)

- Prepared for event through intensive interdisciplinary training in computer science, medicine and biology for 6 months
- Developed paper writing and teamwork skills when conducting scientific research in English

- Originated machine learning, mathematical optimization, differential equation, stochastic process models to improve the performance of a synthetic signal transducer system on cell membranes, and wrote a report detailing the modeling
- Designed webpages to illustrate our work (see, for example, our webpage for the modeling: [2018.igem.org/Team:Fudan-CHINA/Model](http://2018.igem.org/Team:Fudan-CHINA/Model))
- Delivered a formal presentation in Boston, and obtained a bronze medal

## Fudan University

Shanghai, P.R. China

## China Undergraduate Mathematical Contest in Modeling

Sept. 2017

- Prepared for event through training on academic knowledge including probability theory, mathematical statistics, and machine learning
- Developed professional skills including modeling and using scientific tools such as Python, MATLAB and Mathematica during the event
- Used cluster analysis, the genetic algorithm and a decision tree to examine the best pricing strategy of a membership app, and used Bayesian estimation to forecast returns
- Was part of the only sophomore team that obtained the first prize in the Shanghai Division

## SELECTED AWARDS AND HONORS

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- Top 10 Students in the School of Information Science and Technology (top 1.3% of ~760 students) 2019
- Outstanding Student in Fudan University (top 5% of ~13,000 students) 2019
- First Prize Scholarship in Fudan University (top 3% of ~13,000 students) 2018
- Bronze Medal in International Genetically Engineered Machine Competition 2018
- Honorable Mention in Interdisciplinary Contest in Modeling (top ~20% of ~10,000 teams) 2018
- First Prize Scholarship in Fudan University (top 3% of ~13,000 students) 2017
- Selected to the Elite Engineer Program in Fudan University based on outstanding research performance (top 5% of ~350 students) 2017
- First Prize in China Undergraduate Mathematical Contest in Modeling (top 5% of ~1,000 teams) 2017

## ADDITIONAL INFORMATION

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### Selected Projects

- Implemented a video stabilization algorithm using Fast Retina Keypoint (FREAK, a feature detection and matching algorithm), a hidden Markov model and a Kalman filter
- Trained a voiceprint recognition model using a recurrent neural network
- Implemented a JPEG 2000 image compression algorithm based on information theory

### Computer Skills and Methods

- PyTorch, Linux, Python, MATLAB, C++, Mathematica, JavaScript
- Machine learning, convolutional neural network, *convex optimization (currently learning)*
- Data structure, computer architecture, digital image processing, signal processing
- Mathematical statistics, random processes, information theory