

QINGWEI FANG

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EDUCATION

Shanghai Jiao Tong University(SJTU)

Shanghai, China

B.S. in Biomedical Engineering, School of Biomedical Engineering

Sept. 2015 – June 2019 (expected)

- **Rank:** 2/53 **GPA:** 3.84/4.30 (89.17/100)
- **Awards:** 2017-2018 **National Scholarship** (2%)
International Genetically Engineered Machine Competition 2018: **Gold medal & Best Diagnostic Track Nominated**

PUBLICATIONS

- Yang Yang*, **Qingwei Fang***, Hongbin Shen. (2018). Predicting Gene Regulatory Interactions by Using Spatial Gene Expression Data and Deep Learning. (*co-first author, under review)

RESEARCH EXPERIENCE

Reconstruction of Gene Regulatory Network (GRN) through Gene Expression Image Analysis

Mar. 2017 – Mar. 2018 Supervisor: Yang Yang (Associate Prof., Department of Computer Science and Engineering, SEIEE, SJTU)

- Constructed the local database of *Drosophila's in situ* hybridization (ISH) images containing gene expression information from *Berkeley Drosophila Genome Project* (BDGP) public database.
- Proposed the idea of supervised method, GripDL, based on an existing large-scale GRN. Designed model with and conducted the experiments under the guidance of Prof. Yang Yang.
- Implemented traditional unsupervised GRN reconstruction algorithm, such as GINI, TD-ARACNE and staNMF (stability-driven Nonnegative Matrix Factorization) as well as traditional feature extraction method, for example SIFT.
- Improved both accuracy and F1 at least 14% compared with the state-of-art staNMF method.

Early and Noninvasive Diagnosis of Colorectal Cancer using Ultrasound Imaging and Genetically Engineered *E.coli*

Feb. 2018 – Nov. 2018 Supervisor: Lin He* (Fellow of Chinese Academy of Sciences), Gang Ma* (Associate Prof.), Yushu Wang* (Assistant Prof.) * School of Life Sciences and Technology, SJTU

- Provided technical support on the manipulation of ultrasound machine.
- Designed ultrasound experiments and performed ultrasound image analysis. Successfully watched and collapsed the ultrasound signal from the genetically engineered *E.coli* in three conditions, showing a promising future of our method in medical applications to promote the popularization of non-invasive screening and early diagnosis of colorectal cancer.
- Established team website.

Electromyogram System for Detecting the Neuro-modulation Effect of Ultrasound Stimulation

Mar. 2018 – Sep. 2018 Supervisor: Junfeng Sun (Associate Prof., School of Biomedical Engineering, SJTU)

- Designed the software to drive MSP430 G2553 chip to collect myoelectric signal, perform A/D conversion and transmit data to upper PC end.
- Developed the software to control upper PC end to receive data, plot the real-time waveform of collected myoelectric signal and detect the motor evoked potential (MEP) through Teager-Kaiser energy (TKE) operator.
- Successful demonstration of signal collection, conversion, transmission, and MEP detection from human forearm muscle group.

PROJECT EXPERIENCE

Three-dimension Segmentation and Reconstruction of Lung CT Images

Dec. 2017 – Jan. 2018

- Combined Otsu optimum global thresholding method, erosion morphological processing on 2-D level and region growing method on 3-D level to perform segmentation of lung CT images. Achieved smooth and refined segmentation of lung from original images compared with simple Otsu or region growing method.

Implementation of Filtered Back Projection (FBP) Algorithm for CT Image Reconstruction

Mar. 2018 – May 2018

- Adapt the FBP implementation for online CT reconstruction using JavaScript, HTML and CSS.
- Implementation of radon and i-radon transformation function from scratch.

Gmap: Automatic Visualization Tool for Human Population Genetic Structure Analysis

Nov. 2017 – Dec 2017

- Improved the original algorithm by proposing automatic segmentation of MST with k-means algorithm, combining principal component analysis (PCA), minimum spanning tree (MST).

TECHNICAL SKILLS

- **Programming Languages:** C/C++, Python, MATLAB, Assembly, R, JavaScript, CSS, HTML
- **Language Skills:** TOEFL (R30 + L26 + S23 + W24, total 103), GRE (V160 + Q168)