Xinliang Zhu

500 UTA Boulevard, ERB 105B
Arlington, TX 76019, United States
(+01)-817-818-8639
xinliang.zhu@mavs.uta.edu
https://xinliangzhu.github.io/online-cv/

Education

2015–Present **Ph.D. Candidate, Computer Science**, *University of Texas at Arlington*, Arlington, TX.
advisor: Professor Junzhou Huang

2012–2015 **M.S, Control Theory and Control Engineering**, *Institute of Automation, Chinese Academy of Sciences*, Beijing, China.
advisor: Professor Shuming Tang

2008–2012 **B.S, Telecommunication Engineering**, *Civil Aviation University of China*, Tianjin, China.

Technical Skills

Proficient With

languages C, C++, Python, R
technologies Vim, Git, Ubuntu, Windows, Mac OSX

Familiar With

languages Matlab
technologies Bash Scripting, OpenMP

Research Interests

Deep Learning, Machine Learning, Survival Analysis, Computer Vision, Bioinformatics

Courses Taken

Machine Learning, Computer Vision, Natural Language Processing, Design and Analysis of Algorithms, Data Modeling, Compiler, Computer Architecture, *etc.*

Publications

Xinliang Zhu, Jiawen Yao, Feiyun Zhu and Junzhou Huang. WSISA: Making Survival Prediction from Whole Slide Pathology Images (**Pending: weak accept**),*CVPR 2017.*

Xinliang Zhu, Jiawen Yao, Guanghua Xiao, Yang Xie, Jaime Rodriguez-Canales, Edwin R. Parra, Carmen Behrens, Ignacio I. Wistuba and Junzhou Huang. Imaging-Genetic Data Mapping for Clinical Outcome Prediction via Supervised Conditional Gaussian Graphical Model (**Regular Paper: acceptance rate 19%**), *IEEE International Conference on Bioinformatics and Biomedicine (BIBM) 2016.*

Xinliang Zhu, Jiawen Yao and Junzhou Huang. Deep Convolutional Neural Network for Survival Analysis with Pathological Images (Short Paper: acceptance rate 19%), *IEEE International Conference on Bioinformatics and Biomedicine (BIBM) 2016.*

Jiawen Yao, Sheng Wang, **Xinliang Zhu** and Junzhou Huang. Imaging Biomarker Discovery for Lung Cancer Survival Prediction (**Oral**), *International Conference on Medical Image Computing and Computer-Assisted Intervention: 2016 (MICCAI), 649–657, 2016.*

Xinliang Zhu, Jiawen Yao, Xin Luo, Guanghua Xiao, Yang Xie, Adi Gazdar and Junzhou Huang. Lung cancer survival prediction from pathological images and genetic data—An integration study, *Biomedical Imaging (ISBI), 2016 IEEE 13th International Symposium on (ISBI), 1173-1176, 2016.*

Feiyun Zhu, Bin Fan, **Xinliang Zhu**, Ying Wang, Shiming Xiang and Chunhong Pan. 10,000+ Times Accelerated Robust Subset Selection (ARSS), *Proc. Assoc. Adv. Artif. Intell 2015. (AAAI)*

Research Experience

2016.09-Present **Learning Fine-grained Information from Weak Labels**, *[Python, Theano, R, Linux]*.

- In big data era, many data are with weak labels. One challenge is how to learn fine-grained information from those weak labels. In our problem of predicting patients' survival, only the giga-pixel level whole slide pathological images and patients-level survival labels are given. Some regions in the whole slide pathological images are discriminative for survival prediction and others are not. How to learn those fine-grained discriminative regions without expert-annotated ROIs is very challenging and critical in this problem. To solve this,
  - One **deep attention-based model** was proposed to solve the challenging problem. Very promising results were achieved on two types of cancers datasets.
  - We are trying to generalize our model to solve other fine-grained learning problems with weak labels.
- 1 paper submitted to *CVPR 2017* (Pending: weak accept)

2016.03-Present **Survival Analysis from Small Sample Medical Datasets**, *[Python, Theano, R, Linux]*.

- Survival analysis is very important in medical treatment, but leading research is challenged by three properties of medical data: 1) the datasets are usually in multiple views; 2) they are in small sample size; and 3) the whole slide pathology images are in gigapixel size. To solve those problems:
  - Efficient deep learning models with specific training strategies were developed to solve the first two problems;
  - A novel framework was also created to solve the third challenge.
- 1 paper accepted by *IEEE BIBM 2016*, 1 paper submitted to *SIGKDD 2017* and 1 paper submitted to *IJCAI 2017.*

2015.09–2016.03 **Big Image-Omics Data Analytics for Clinical Outcome Prediction**, *[R, Linux]*.

- In this research, we explored analyzing Image-Omics data for clinical outcome prediction from three aspects:
  - Integrating features extracted from pathology image patches with genetic signature expressions to improve the survival prediction accuracy;
  - Developing methods for imaging biomarker discovery;
  - Mapping clinical outcome correlated Imaging-Genetic data by developing supervised conditional Gaussian graphical model (SuperCGGM).
- 3 papers accepted by *IEEE ISBI 2016, MICCAI 2016* and *IEEE BIBM 2016* respectively.

2014.03–2015.06 **Pedestrian Detection with RGBD Data in Outdoor Scene**, *[C/C++, OpenCV]*.

- As a popular research topic, pedestrian detection has played an important role in both Intelligent Transportation Systems and Autonomous Vehicles. RGBD images are with the advantages of both RGB images and depth images. However, for the outdoor usage, the existing RGBD sensors like Kinect were inapplicable. Thus, in this research:
  - Created a novel method for RGB and depth images registration in outdoor scenes;
  - Collected over 10,000 RGBD outdoor pedestrain RGBD images;
  - Developed a fast pedestrian detection framework based on RGBD images.
- 1 patent on RGB image and depth image registration is pending

Projects

2015.09–Present **Large Scale Learning for Complex Image-Omics Data Analytics**, *[Python, Theano, R, Linux]*.

This project aims to develop computational tools for analyzing complex pathology image data as well genomics data. To solve the key and challenging problems in mining comprehensive heterogeneous image and genomic data, novel large scale learning tools and explore ways to integrate features from multiple data sources for clinical outcome prediction are developed. It will greatly support the Precision Medicine Initiative, which enables physicians to select individualized treatments. **I work on develop feature learning from gigapixel whole slide pathology images and integrating imaging-omics data methods**.

2013.01–2015.06 **Miniature Autonomous Vehicle**, *[C/C++, OpenCV, Linux]*.

The miniature autonomous vehicle was built from a toy car. It mainly consisted of a toy car, 3 web cameras, 1 ultrasonic radar and a motherboard equipped with Ubuntu 12.04LTS. It could do traffic signs recognition, traffic light recognition, road line detection and also be with the basic functions of a toy car. **I was in charge of building the traffic signs recognition module and testing the hardware&software architecture**.

2010.10–2011.04 **SOAR-based Air Traffic Control Simulation System**, *[SOAR, Java]*.

Using SOAR as a cognition architecture to simulate an air traffic controller's decision making could potentially make the training of an air traffic controller easier and with more fun. **I was the software architect of the whole system and the main designer of the rules used in SOAR architecture**.

Academic Experience

Reviewer ITSC 2014

Summer School Autonomous Vehicle Summer School 2013, Machine Learning Summer School 2014 (Colocated with ICML), TACC 2016 Summer Supercomputing Institute (UT Austin)

Teaching Experience

CSE 1311 (C/C++ Programming Language), CSE 1320 (C/C++ Programming Language), CSE 5311(Design and Analysis of Algorithms)

Selected Honors and Awards

2016 IEEE BIBM 2016 Student Travel Award (**36 in total**)

2014 Outstanding Student of University of Chinese Academy of Sciences (**Winning Rate: 15%**)

2013 Hebei Province Sports Robot Contest (**First Prize**)