Tianpei Xia

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EDUCATION

North Carolina State University, Raleigh, NC — Aug. 2016 - Dec. 2020
Ph.D. in Computer Science | Adviser: Dr. Tim Menzies

The University of Texas at Dallas, Richardson, TX — Aug. 2013 - Dec. 2015
M.S. in Computer Science

Nanjing University of Posts and Telecom., Nanjing, China — Sep. 2009 - Jun. 2013
B.S. in Electrical Engineering

SKILLS AND INTERESTS

- Experience in machine learning, software analytics, hyperparameter optimization and software development.
- Proficient in *Python*, familiar with *Java and R*, good at ML tools: Scikit-learn, Pytorch, Keras.
- Interested in back-end/infrastructure development as well as machine learning and computer vision engineering and research positions.

SELECTED PROJECTS

NSF Funded: Search-based Software Engineering Research — Aug, 2017 - Present
Research Assistant Under Dr. Tim Menzies, North Carolina State University, USA

- **Evolutionary Algorithms for Hyperparameter Optimization:** Developed a hyperparameter optimization framework called OIL (Optimized Inductive Learning), which applied evolutionary algorithms (e.g. Differential Evolution and NSGA-II) to supercharge software analytic tasks. OIL was tested on a wide range of optimizers with 945 projects data. Experimental results show that OIL improved the performance of effort estimation in terms of accuracy (won 16 out of 18 cases) and efficiency (reduced runtime from days to hours), respectively.
- **Sequential Model Optimization for Software Effort Estimation:** Applied and developed a sequential model based method (a.k.a active learning method) named "FLASH" for the first time in software effort estimation domain. With the constraints of specific computation costs, FLASH can efficiently find good configurations of machine learning methods for effort estimations (e.g. CART). Overall it can improve the performance of software effort estimation tasks by 11% on average in terms of accuracy.
- **Effort Estimation for Agile Projects on GitHub:** Developed and applied a software effort estimation architecture named ROME (Rapid Optimization Methods for Effort-estimation) on massive agile project datasets. The data is collected from the largest online repository hosting service GitHub by using its APIs and self-defined feature selection module. In the experiment, ROME can achieve comparable performance with much less computing resources.

System migration for educational computer programming game — Jan, 2017 - May, 2017
Research Project, Game2Learn Lab, North Carolina State University, USA

- **Game Platform Migration:** Helped to migrate an educational purpose programming game, BOTS, from its original developing platform "Unity 4" to "Unity 5" by using JavaScript. After migration, more potential features are enabled for the game's future extension and development. BOTS is a serious puzzle game designed to teach programming fundamentals for novice computer users.

Satellite images change detection by using Gaussian Mixture Model — Jan, 2017 - May, 2017
Graduate Course Project, North Carolina State University, USA

- **Image Change Detection:** Applied and developed a Gaussian mixture model to identify landscape changes using high resolution satellite images. This grid-based method has competitive performance in Bi-temporal change detection. Given two very high resolution satellite images from the same landscape area, it can achieve, if not better, similar performance as humans in terms of landscape change detection.

SELECTED PUBLICATIONS

- **Tianpei Xia**, Rahul Krishna, Jianfeng Chen, George Mathew, Xipeng Shen, Tim Menzies, *Hyperparameter Optimization for Effort Estimation*. **EMSE (Under Review)**, 2018. → tiny.cc/txiaHyper.
- **Tianpei Xia**, Rui Shu, Tim Menzies, *Sequential Model Optimization for Effort Estimation of Contemporary Software Projects*. **In preparation**, 2019.
- Rui Shu, **Tianpei Xia**, Tim Menzies, *Application of Data Balancing and Hyperparameter Optimization in Security Bug Report Prediction*. **In preparation**, 2019.