Ziniu Hu

Education

2014–2018 **Bachelor of Science**, *Computer Science and Technology*, Peking University, Beijing, China.

Research Experience

2015–present **Research Assistant**, *Institute of Software*, Peking University.
Advisor: Prof. Xuanzhe Liu
Topic: Android application analytics and mobile user behavior mining and profiling.

2017–present **Full-time Intern**, *Machine Learning group*, Microsoft Research Asia.
Advisor: Dr. Jiang Bian
Topic: Predicting Chinese stock trend using online news.

Research Interests

Machine Learning Especially on structural knowledge with statistical models, using representation learning and knowledge graphs.

Data Mining Especially on addressing real-world problems that entail complex structural data, such as time series, heterogeneous network and spatiotemporal data.

Research Projects

2017.3–present **A Deep Learning Framework for News-oriented Stock Trend Prediction**, [1].
- Intern project at Machine Learning group, Microsoft Research Asia(MSRA).
- Crawled and processed financial news, and setup up MongoDb with ElasticSearch to index the news.
- Proposed a Hybrid Attention Networks (HAN) model with attention mechanisms on both news and temporal level, and trained the model using linearly regularized self-paced learning.
- Full paper published on WSDM'18 (accept rate of 16.1%).

2017.9–present **Semi-smooth Newton Method for Linear Programming**.
- Course project for "Convex Optimization"
- Designed a semi-smooth Newton method to minimize augmented Lagrangian function in dual problems.
- Implemented and compared our semi-smooth Newton method with DRS, ADMM for linear programming.

2017.9–present **Automating Web and Android UI beautification**.
- Proposed an intermediate language for the multi-platform UI and the corresponding compilers.
- Extracted structural templates for a generator design by tree-structural clustering.
- Fine-tuned the layout using gan framework, with a cnn-based discriminator and a sequential generator.

2016.8–2017.3 **User Behavior Analysis Of Inter-App Navigation**, [2].
- Implemented a background data collection app to conduct a field study.
- Found several time consuming navigation processes using spectral cluster.
- Built a one-class classification model with boosting mechanism to predict users' navigational behavior.
- Currently under review by the Transaction of Mobile Computing.

2016.7–2016.9 **Optimize Release Strategy for Android Apps**, [3].
- Conducted an in-depth analysis in the release history of 17820 Android apps.
- Revealed several important characteristics of update intervals and their effects.
- Built a classification model to optimize the release opportunity to gain user adoption.
- Full paper published on the Asia-Pacific Symposium on Internetware.

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2015.9–2016.7 **Android Application Dynamic Analysis & Deep Link Generator**, [4, 5].

- Used an UI structure based comparison approach to distinguish different pages.
- Learned the transition graph on-the-fly, based on which to trigger further crawling processes.
- Recorded the intent series for replay and deep links generation.
- Poster published on the ICSE'17 and full paper published on the WWW'18 (accept rate of 14.8%).

2015.9–2016.1 **Snake Combat AI Game Using Alpha-beta Pruning with Neuroevolution Algorithm**.

- Course project for "Practice of Programming", ranked among top 5 out of 172 competitors
- Trained an AI to play a double-player combat game "Snake" on botzone platform.
- Implemented alpha-beta pruning algorithm as the searching skeleton, with a neural network trained by an evolutionary algorithm NEAT to assess the situation.

Awards

2017 SenseTime Scholarship (Only 30 in China).

2017 SIGIR Student Travel Grant.

2017 Outstanding Undergraduate Research Award of Peking University.

2016 Honorable Mention of Interdisciplinary Contest In American Mathematical Modeling.

2015 Third Prize of ACM programming contest in Peking University.

2015 May Forth Scholarship of Peking University.

2014 First Prize of Chinese Physics Olympiad, Zhejiang District.

Skills

Programming Java(Android), Python, C/C++, JavaScript, MATLAB, LaTeX

Tools Git, Machine Learning Library (scikit-learn, TensorFlow, Keras, CVXPY), NLP Toolkit(NLTK, Gensim), Optimization Software(Mosek, Gurobi), Database(MySQL, MongoDb), Search Engine(ElasticSearch, Solr)

Publications

Ziniu Hu, Weiqing Liu, Jiang Bian, Xuanzhe Liu, and Tie-Yan Liu. **Listening to Chaotic Whispers: A Deep Learning Framework for News-oriented Stock Trend Prediction**. In *Proceedings of the 11th ACM International Conference on Web Search and Data Mining, (**WSDM'18**)*.

Ziniu Hu, Yun Ma, Xuanzhe Liu, Qiaozhu Mei, and Jian Tang. **Roaming across the Castle Tunnels: an Empirical Study of Inter-App Navigation Behaviors of Android Users**. *CoRR abs/1706.08274 (Currently under review by the Transaction of Mobile Computing)*.

Sheng Shen, Xuan Lu, and **Ziniu Hu**. **Towards Release Strategy Optimization for Apps in Google Play**. In *Proceedings of the 9th Asia-Pacific Symposium on Internetware, (**Internetware'17**)*.

Yun Ma, **Ziniu Hu**, Yunxin Liu, Tao Xie, and Xuanzhe Liu. **Aladdin: Practical Automation of Deep Link APIs Release on Android**. In *Proceedings of the 27th International Conference on World Wide Web, (**WWW'18**)*.

Yun Ma, Xuanzhe Liu, **Ziniu Hu**, Dian Yang, Gang Huang, Yunxin Liu, and Tao Xie. **Aladdin: Automating Release of Android Deep Links to In-app Content**. In *Proceedings of the 39th International Conference on Software Engineering, (**ICSE'17**)*.