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Zhiqian Chen

Ph.D. candidate, Computer Science, Virginia Tech

Highlight

Publications: Deep Learning (6 papers), Graph Deep Learning (2 papers), Generative Model (2 papers), Interdisciplinary Research (5 papers for material, circuit security, and music composition), Urban Computing (6 papers). 18 papers in total.
Award: Outstanding Contribution Award by Toyota Research.
Service: TKDE/ CIKM/ AAAI /Neurocomputing etc.

Education

Virginia Tech, Virginia, United States
- *Ph.D.*, Computer Science, *Aug' 14 - Jul' 20 (Expected)*

Peking University, Beijing, China
- *MEng*, Software Engineering, *Sept' 10 - Jul' 13*

Huazhong University of Sci & Tech, Wuhan, China
- *BSc*, Software Engineering, minor in Japanese *Sept' 05 - Jul' 09*

Project Experience

Forecasting Transformative Technologies using Big Data
Research Assistant, Supervisor : Dr. Chang-Tien Lu *Aug '18 - Sep '18*

- **Goal:** Modeling and forecasting forward citations to a patent for the discovery of emerging technologies and for measuring the pulse of inventive progress.
- **Method:** A sequence-to-sequence model is proposed to employ an attention-of- attention mechanism to capture the dependencies of these multiple time sequences.
- **Output:** Results have been publish in IJCAI 2019

Advanced Analytics for Trustworthy Storytelling
Research Assistant, Supervisor: Dr. Chang-Tien Lu *Aug '15 - Sep '17*

- **Goal:** Discover story line of events from web documents.
- **Method:** We explore several methodologies for extract storylines, such as hierarchical cluster routing, shared subspace and temporal smoothness, and multimodel learning
- **Output:** Multiple papers have been published in IJCAI and IEEE Big Data

Automated Power Line Inspection Using Unmanned Aerial Vehicles
Research Assistant, Supervisor : Dr. Chang-Tien Lu *Aug '14 - May '15*

- **Goal:** Automatically design flight plan of unmanned aerial vehicles.
- **Method:** We present automated flight plan builder DIFPL which pre-builds ight plans for drones to survey a large area. The flight plans are built for subregions and fed into drones which allow them to navigate autonomously. DIFPL employs a distributed paradigm on the Hadoop MapReduce framework.
- **Output:** Results has been published at GISTAM 2015 as the best student paper, and an enhanced version has been published in Journal of Big Data.

Industry Experience

Toyota Research Institute North America
Research Intern, Supervisor : Dr. Chen Ling *May '16 - Aug '16*

- **Machine learning application in material research:** applying unsupervised learning techniques for battery material discovery; developing tools to collect and analyze data from material database
- **Publication**: This work has been published in **Nature Communications**.
- **Award**: *Outstanding Contribution Award* by Toyota Research.
- **U.S. Patent:** System and method to quantify structural properties and predict bulk properties of inorganic materials. (publication # US20180336288A1)

Baidu Inc.
Research and Development, wenku.baidu.com *Jul '11 - Aug '13*

- **Data Analysis:** Data mining on large scale of users' access log for detecting user behaviour pattern; set up a platform for applying big data technologies (Hadoop/Hive) to accelerate data analysis
- **The Best Team in 2012** at Baidu Inc. (Top 3)

Langdong Tech Inc.
Algorithm Engineer, a member of the founding team *Feb '14 - Jul '14*

- **Data Analysis:** Analyze user behaviour via web server log
- **Web Development:** Develop back-end server to support mobile applications on iOS and Android.
- Our fitness app was selected as **The Best of 2013 by Apple Inc.,** (Top 6 in China).

Publications

Ying Zhang, Xingfeng He, **Zhiqian Chen**, Qiang Bai, Charles A.Roberts, Debasish Banerjee, Tomoya Matsunaga, Yifei Mo, Chen Ling. "Unsupervised Discovery of Solid-State Lithium Ion Conductors". **Nature Communications** (IF: 11.880, h5-index: 260), 2019. DOI: 10.1038/s41467-019-13214-1

Zhao Ding, **Zhiqian Chen**, Leon Shaw, Tianyi Ma, Wenhui Ma, Chang-Tien Lu. "Predicting the Hydrogen Release Ability of $LiBH_4$-based Mixtures by Ensemble Machine Learning". **Energy Storage Materials**. (accepted, IF: 15.97)

Subhodip Biswas, Fanglan Chen, Andreea Sistrunk, Nathan Self, **Zhiqian Chen**, Chang-Tien Lu, Naren Ramakrishnan, "Geospatial Clustering for Balanced and Proximal Schools", *Proceedings of the Tenth AAAI Symposium on Educational Advances in Artificial Intelligence* (**AAAI-EAAI**), New York, NY, February 8-9, 2020. (accepted)

Zhiqian Chen, Gaurav Kolhe, Setareh Rafatirad, Chang-Tien Lu, SaiManoj PudukotaiDinakarrao, Houman Homayoun and Liang Zhao. "Estimating the Circuit Deobfuscating Runtime based on Graph Deep Learning". Design, Automation, and Test in Europe (**DATE**), 2020. (acceptance rate: 26%, accepted)

Subhodip Biswas, Fanglan Chen, **Zhiqian Chen**, Andreea Sistrunk, Nathan Self, Kaiqun Fu, Chang-Tien Lu, Naren Ramakrishnan. "REGAL: A Regionalization framework for school boundaries". *Proceeding of the 27th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems* (**SIGSPATIAL**), Paper ID: 258, Chicago, IL, Nov. 5-8, 2019.

Taoran Ji, **Zhiqian Chen**, Nathan Self, Kaiqun Fu, Chang-Tien Lu, Naren Ramakrishnan. "Patent Citation Dynamics Modeling via Multi-Attention Recurrent Networks". *Proceedings of the 28th International Joint Conference on Artificial Intelligence* (**IJCAI**), pp. 2621-2627, Macao, China, Aug. 10-16, 2019. DOI: 10.24963/ijcai.2019/364 (Acceptance rate: 17.8%)

Zhao Ding, Shaoyuan Li, Yang Zhou, **Zhiqian Chen**, Weijie Yang, Wenhui Ma, Leon Shaw. "$LiBH_4$ for hydrogen storage - New perspectives". **Nano Materials Science**, 2019. DOI: 10.1016/j.nanoms.2019.09.003

Zhiqian Chen, Feng Chen, Rongjie Lai, Xuchao Zhang, Chang-Tien Lu. "Rational Neural Networks for Approximating Jump Discontinuities of Graph Convolution Operator". *Proceedings of the IEEE International Conference on Data Mining* (**ICDM**), pp. 59-68, Singapore, Nov. 17-20, 2018. DOI: 10.1109/ICDM.2018.00021 (Acceptance rate: 8.86% Full Paper)

Kaiqun Fu, **Zhiqian Chen**, Chang-Tien Lu. "StreetNet: Preference Learning with Convolutional Neural Network on Urban Crime Perception". *Proceeding of the 26th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems* (**SIGSPATIAL**), Seattle, WA, Nov. 6-9, 2018. DOI: 10.1145/3274895.3274975

Manu Shukla, **Zhiqian Chen**, Chang-Tien Lu. "DIMPL: A Distributed In-Memory Drone Flight Path Builder System". **Journal of Big Data**, Springer, July 2018, Vol. 5, No.24. DOI: 10.1186/s40537-018-0134-7

Xuchao Zhang, Liang Zhao, **Zhiqian Chen**, Chang-Tien Lu. "Distributed Self-Paced Learning in Alternating Direction Method of Multipliers". *Proceedings of the Twenty-Seventh International Joint Conference on Artificial Intelligence* (**IJCAI**), pp. 3148-3154, Stockholm, Sweden, July 13-19, 2018. https://www.ijcai.org/proceedings/2018/437, DOI: 10.24963/ijcai.2018/437

(Acceptance rate: 20.46%)

Bingsheng Wang*, **Zhiqian Chen***, Arnold P. Boedihardjo, Chang-Tien Lu. "Virtual Metering: An Efficient Water Disaggregation Algorithm via Non-Intrusive Load Monitoring". *ACM Transactions on Intelligent Systems and Technology* (**TIST**), Vol. 9, Issue 4, Article No. 39, February 2018. DOI: 10.1145/3141770

Zhiqian Chen, Chih-Wei Wu, Yen-Cheng Lu, Alexander Lerch, Chang-Tien Lu. "Learning to Fuse Music Genres with Generative Adversarial Dual Learning". *Proceedings of the IEEE International Conference on Data Mining* (**ICDM**), pp. 817-822, New Orleans, Louisiana, Nov. 18-21, 2017. DOI: 10.1109/ICDM.2017.98 (Acceptance rate: 19.9%)

Xuchao Zhang, Liang Zhao, **Zhiqian Chen**, Arnold P. Boedihardjo, Chang-Tien Lu. "Trendi: Tracking Stories in News and Microblogs via Emerging, Evolving and Fading Topics". *Proceedings of the IEEE International Conference on Big Data* (**Big Data**), pp. 1590-1599, Boston, MA, Dec. 11-14, 2017. DOI: 10.1109/BigData.2017.8258093

Xuchao Zhang, **Zhiqian Chen**, Liang Zhao, Arnold P. Boedihardjo, Chang-Tien Lu. "TRACES: Generating Twitter Stories via Shared Subspace and Temporal Smoothness". Proceedings of the IEEE International Conference on Big Data (**Big Data**), pp. 1688-1693, Boston, MA, Dec. 11-14, 2017. DOI: 10.1109/BigData.2017.8258093

Zhiqian Chen, Xuchao Zhang, Arnold P. Boedihardjo, Jing Dai, Chang-Tien Lu. "Multimodal Storytelling via Generative Adversarial Imitation Learning". *Proceeding of the 26th International Joint Conference on Artificial Intelligence* (**IJCAI**), Melbourne, Australia, August 19-25, 2017. DOI: 10.24963/ijcai.2017/554 (Acceptance rate: 26%)

Xuchao Zhang, **Zhiqian Chen**, Weisheng Zhong, Arnold P. Boedihardjo, Chang-Tien Lu. "Storytelling in heterogeneous Twitter entity network based on hierarchical cluster routing". *Proceedings of the IEEE International Conference on Big Data* (**Big Data**), pp. 1522-1531, Washington, DC, Dec. 5-8, 2016. DOI: 10.1109/BigData.2016.7840760

Manu Shukla, **Zhiqian Chen**, Chang-Tien Lu. "DIFPL: Distributed drone flight path builder system". *Proceedings of the 1st International Conference on Geographical Information Systems Theory, Applications and Management* (**GISTAM**), Barcelona, Spain, April 28-30, 2015. (Best Student Paper Award)

Zhiqian Chen, Wenya Feng. "Detecting Impolite Crawler by Using Time Series Analysis". *Proceedings of 25th IEEE International Conference on Tools with Artificial Intelligence* (**ICTAI**), pp. 123-126, Herndon, VA, USA, November 4-6, 2013. DOI 10.1109/ICTAI.2013.28

Ongoing Works

Kaiqun Fu, **Zhiqian Chen**, Chang-Tien Lu. "GC-StreetNet: Preference Learning with Graph Convolutional Neural Network on Urban Crime Perception". **GeoInformatica**. (under review)

Zhiqian Chen, Fanglan Chen, Lei Zhang, Taoran Ji, Liang Zhao, Feng Chen, Chang-Tien Lu. "Bridging the Gap between Spatial and Spectral Domains: A Review on Graph Neural Networks". International Joint Conference on Artificial Intelligence –Pacific Rim International Conference on Artificial Intelligence (**IJCAI-PRICAI 2020**). (under review)

Zhiqian Chen, Lei Zhang, Gaurav Kolhe, Hadi Mardani Kamali, Setareh Rafatirad, Sai manoj Pudukotai dinakarrao, Houman Homayoun, Chang-Tien Lu, Liang Zhao. " Deep Logic Graph Learning for Hardness Estimation of SAT" International Joint Conference on Artificial Intelligence –Pacific Rim International Conference on Artificial Intelligence (**IJCAI-PRICAI 2020**). (under review)

Taoran Ji, Kaiqun Fu, Nathan Self, **Zhiqian Chen**, Chang-Tien Lu Naren Ramakrishnan. "Dynamic Multi-Context Attention Networks for Citation Forecasting of Scientific Publications" International Joint Conference on Artificial Intelligence –Pacific Rim International Conference

on Artificial Intelligence (**IJCAI-PRICAI 2020**). (under review)

Gaurav Kolhe, **Zhiqian Chen**, Lei Zhang, Avesta Sasan, Setareh Rafatirad, Chang-Tien Lu, Sai Manoj Pudukotai Dinakarrao, Hamid Mahmoodi, Liang Zhao, Houman Homayoun. "SEPIANN: Security Evaluation Platform for SAT-Hardness using Intelligent Artificial Neural Net" ACM International Conference on Knowledge Discovery and Data Mining (SIGKDD) 2020 (under review)

Kaiqun Fu, Taoran Ji, **Zhiqian Chen**, Chang-Tien Lu. "HastGCN: A Hierarchical Attention-based Spatiotemporal Graph Convolution Network for Traffic Incident Impact Forecasting" ACM International Conference on Knowledge Discovery and Data Mining (SIGKDD) 2020 (under review)

Lei Zhang, **Zhiqian Chen**, Lingfei Wu, Yanfang Ye, Chang-Tien Lu and Liang Zhao. "From Dynamics on Graphs to Dynamics of Graphs: an Adaptive Echo-state Dynamic Graph Transformer" ACM International Conference on Knowledge Discovery and Data Mining (SIGKDD) 2020 (under review)

Awards & Patent

Outstanding Contribution Award, summer 2016, Toyota Research
Best Student Paper Award at GISTAM 2015
IEEE International Conference on Data Mining travel award 2017, 2018
U.S. Patent: "System and method to quantify structural properties and predict bulk properties of inorganic materials". (publication # US20180336288A1)

Review Service

IEEE Transactions on Knowledge and Data Engineering (**TKDE**)
ACM International Conference on Information and Knowledge Management (**CIKM**)
AAAI conference on Artificial Intelligence (**AAAI**)
Neurocomputing, Elsevier
GeoInformatica, Springer

volunteer

IEEE International Conference on Data Mining (**ICDM**)

References

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