Chaoqi Yang

201 N Goodwin Ave, Urbana, Illinois, USA

chaoqiy2@illinois.edu (+1) 217-979-6761 chaoqiyang.com

EDUCATION

University of Illinois at Urbana Champaign **Illinois, USA**
M.S. in Computer Science (with thesis), GPA: 4.0/4.0 *Aug 2019 - May 2021 (Exp)*

Courses: CS510 Advanced Information Retrieval, CS547 Deep Learning, CS598 Machine Learning for Signal Processing, ECE543 Statistical Learning Theory, MATH481 Vector and Tensor Analysis (intro. to differential geometry/manifold), MATH540 Real Analysis (listening), CS473 Algorithms

Shanghai Jiao Tong University **Shanghai, China**
B.E. in Information Security, GPA: 3.86/4.30, Rank: 5/97 *Sep 2015 - Jul 2019*

Courses: Mathematical Analysis I (91/100), Mathematical Analysis II (96/100), Linear Algebra (95/100), Probability and Statistics (98/100), Number Theory (90/100), Abstract Algebra (96/100), Signals and System (96/100), Digital Signal Processing (94/100)

RECENT PROJECTS

Deep Learning for Medication Recommendation **UIUC, USA**
Research Assistant, with Prof. Jimeng Sun *May 2020 - present*

- We are the first to utilize drug molecule features for the recommendation task. We design two novel molecule encoders to represent drug molecules, and the model reduces DDI by 20.17%, improves Jaccard similarity by 2.81% and F1-score by 2.07% in MIMIC-III.
- In parallel, we propose a recurrent residual learning model for medication change prediction. Our change prediction model is interpretable and efficient, and it improves F1-score by 4.6% and 7.4% in inpatient MIMIC-III and outpatient IQVIA PharMetric Plus dataset.

Algorithmic Design on Graph Convolutional Networks **UIUC, USA**
Research Assistant, with Prof. Tarek Abdelzaher *Aug 2019 - Jun 2020*

- We design a hypergraph expansion and derive some theoretical properties. The proposed expansion could allow an elegantly application of GCNs to hypergraphs. The propose learning algorithm could achieve 2% accuracy improvement in node classification over five real world hypergraphs.
- We revisit the oversmoothing issue of GCNs from an optimization perspective and find that GCNs can actually learn anti-oversmoothing, whereas overfitting is the real obstacle in deep GCNs.

DARPA Projest: Social Simulation **UIUC, USA**
Research Assistant, with Prof. Tarek Abdelzaher and Prof. Jiawei Han *Aug 2019 - May 2020*

- We propose a universal multi-belief structure (using Venn diagram) under certain socail topics and build a new class of NMF approaches to disentangle major beliefs from user-generated text.
- We build simulation core to analyze and predict how information (CVEs, narratives, hashtages, video urls) propagate in social networks (Twitter, Github, Reddit, Youtube). We rank the top in the DARPA bi-annual challenge competition.

INTERNSHIP

Multi-objective Reinforcement Learning on RTB **Beijing, China**
Data Science Intern, with Liubin Wang and Dr. Haishan Liu *Nov 2018 - Jun 2019*

- We mine large-scale impression/click/conversion logs from Tencent Ad system. We formulate the ad allocation problem as multi-objective reinforcement learning and build distributed models.
- We design a sequential information clustering technique to categorize ad behavior and then apply standard A3C framework on a combined objective function. This work is accepted by CIKM2019.
- We also design a multi-objective actor-critic model to learn multiple objectives asynchronously and provide theoretical analysis. This model could improve revenue by 4.2% and ROI by 2.7% in the sampled dataset.

MANUSCRIPTS

1. Chaoqi Yang, Ruijie Wang, Shuochao Yao, Tarek Abdelzaher. "Hypergraph Learning with Line Expansion", arXiv:2005.04843
2. Chaoqi Yang, Ruijie Wang, Shuochao Yao, Shengzhong Liu, Tarek Abdelzaher. "Revisiting 'Over-smoothing' in Deep GCNs", arXiv:2003.13663.
3. Tarek Abdelzaher, Heng Ji, Jinyang Li, Chaoqi Yang, John Dellaverson, Lixia Zhang, Chao Xu, Boleslaw K Szymanski. "The Paradox of Information Access: Growing Isolation in the Age of Sharing", arXiv:2004.01967.
4. Chaoqi Yang, Jinyang Li, Ruijie Wang, Shuochao Yao, Huajie Shao, Dongxin Liu, Shengzhong Liu, Tianshi Wang, Tarek Abdelzaher. "Disentangling Overlapping Beliefs by Structured Matrix Factorization", arXiv:2002.05797.
5. Chaoqi Yang, Junwei Lu, Xiaofeng Gao, Haishan Liu, Qiong Chen and Gongshen Liu. "MoTiAC: Multi-Objective Actor-Critics for Real-Time Bidding", arXiv:2002.07408.
6. Kanika Narang, Chaoqi Yang, Adit Krishnan, Junting Wang, Hari Sundaram, Carolyn Sutter. "An Induced Multi-Relational Framework for Answer Selection in Community Question Answer Platforms", arXiv:1911.06957.

PUBLICATIONS

1. Xiaofeng Gao, Xiaosong Jia, Chaoqi Yang, Guihai Chen. "Using Survival Theory in Early Pattern Detection for Viral Cascades" accepted in IEEE Transactions on Knowledge and Data Engineering (**TKDE** 2020).
2. Junwei Lu, Chaoqi Yang, Xiaofeng Gao, Liubin Wang, Changcheng Li and Guihai Chen. "Reinforcement Learning with Sequential Information Clustering in Real-Time Bidding" accepted in International Conference on Information and Knowledge Management (**CIKM** 2019).
3. Qitian Wu, Chaoqi Yang, Xiaofeng Gao, Peng He and Guihai Chen. "EPAB: Early Pattern Aware Bayesian Model for Social Content Popularity Prediction" accepted in International Conference on Data Mining (**ICDM** 2018).
4. Qitian Wu, Chaoqi Yang, Hengrui Zhang, Xiaofeng Gao, Paul Weng and Guihai Chen. "Adversarial Training Model Unifying Feature Driven and Point Process Perspectives for Event Popularity Prediction." accepted in International Conference on Information and Knowledge Management (**CIKM** 2018).
5. Chaoqi Yang, Qitian Wu, Xiaofeng Gao and Guihai Chen. "EPOC: a survival perspective Early Pattern detection model for Outbreak Cascades" accepted in International Conference on Database and Expert Systems Applications (**DEXA** 2018).

AWARDS & ACHIEVEMENTS

- CCF Outstanding Undergraduate Award (73 recipients nationwide) 2019
- Outstanding Graduates in Shanghai (42 recipients out of 800+ in EECS) 2019
- Top-10 Merit Students (10 recipients in University, 1 out of 800+ in EECS) 2018
- Rong Chang Science and Innovation Scholarship (20 out of 800+ in EECS) 2018
- ACM CIKM Travel Grant 2018
- Meritorious Winner, Mathematics Contest in Modeling (Top 8% globally) 2018
- 1st Prize, Chinese Mathematical Olympiad (Top 0.1% in Zhejiang, China) 2014

OTHERS

- Reviewer Service: ECML-PKDD 2020, AAAI 2021
- I have implemented PCA, NMF, ICA, MDS, ISOMAP here and NN, CNN here from scratch.
- I can analyze the expressive power of Neural Networks here
- Skills: Python (PyTorch), C++, Matlab, Git, Vim, Web Programming (COVID-19 demo here)
- Proficient in C++, Python (Numpy, Pandas, Torch, Scipy, Sklearn), Vim, HTML
- Graduate Record Examinations (GRE) 329+4.0 (V: 159, Q: 170, AW: 4.0)
- I like photography (check my gallery), music (guitar), sports (table tennis, badminton, swimming).

Updated on September 21, 2020