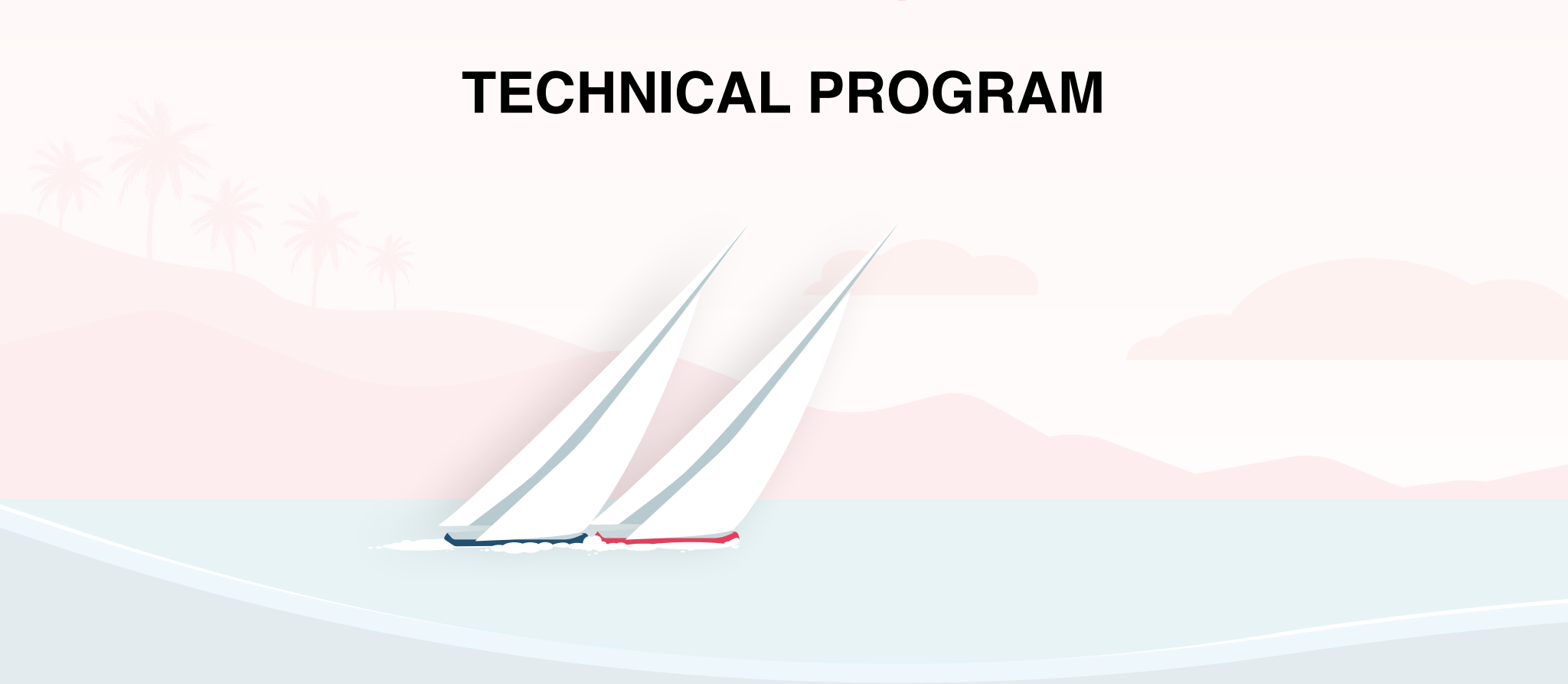
KDD2020

TECHNICAL PROGRAM



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Autoencoders Session Chair: Giovanni Stilo

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Reinforcement Learning Session Chair: Yingbin Liang

Room 2

10:00 AM-12:00 PM (PDT)

Fairness, Equity and Justice Session Chair: Tanya Berger-Wolf

1:30 PM-3:30 PM (PDT)

Social Informatics Session Chair: Jiebo Luo

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Parallel and Distributed Learning and System Session Chair: Zhouyuan Huo

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Research Track

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Time-series and Data Streams Session Chair: Souhaib Ben Taieb

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Semi-supervised Learning 1 Session Chair: Weili Wu

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Recommender Systems 1 Session Chair: Olfa Nasraoui

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Healthcare and Health Informatics 2 Session Chair: Junzhou Huang

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Graph Neural Networks Session Chair: Lingfei Wu

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Mining Spatial, Temporal Data Session Chair: Jing Li

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Big Data Infrastructure Session Chair: Shipeng Yu

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Responsible Data Science/Social Impact Session Chair: Ying Li

Research Papers

*All listed times are in PST. Poster Q&A's are offered twice to accommodate different time zones.

Session 1

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Fairness, Equity and Justice

424 **InFoRM: Individual Fairness on Graph Mining**
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668 **Towards Fair Truth Discovery from Biased Crowdsourced Answers**
Yanying Li: Stevens Institute of Technology; Haipei Sun: Stevens Institute of Technology; Wendy Hui Wang: Stevens Institute of Technology

1525 **Evaluating Fairness using Permutation Tests**
Cyrus DiCiccio: Linkedin Corporation; Sriram Vasudevan: Linkedin Corporation; Kinjal Basu: Linkedin Corporation; Krishnaram Kenthapadi: Amazon AWS AI; Deepak Agarwal: Linkedin Corporation

2025 **List-wise Fairness Criterion for Point Processes**
Jin Shang: Louisiana State University; Mingxuan Sun: Louisiana State University; Nina S. N. Lam: Louisiana State University

2191 **Algorithmic Decision Making with Conditional Fairness**
Renzhe Xu: Tsinghua University; Peng Cui: Tsinghua University; Kun Kuang: Zhejiang University; Bo Li: Tsinghua University; Linjun Zhou: Tsinghua University; Zheyan Shen: Tsinghua University; Wei Cui: Squirrel AI Learning

Graph Mining 1

47 **Higher-order Clustering in Complex Heterogeneous Networks**
Aldo Carranza: Stanford University; Ryan Rossi: Adobe Research; Anup Rao: Yale University; Eunyee Koh: Adobe

196 **SSumM: Sparse Summarization of Massive Graphs**
Kyuhan Lee: Korea Advanced Institute of Science and Technology; Hyeonsoo Jo: Korea Advanced Institute of Science and Technology; Jihoon Ko: Korea Advanced Institute of Science and Technology; Sungsu Lim: Chungnam National University; Kijung Shin: Korea Advanced Institute of Science and Technology

306 **Local Community Detection in Multiple Networks**
Dongsheng Luo: The Pennsylvania State University; Yuchen Bian: Baidu Research USA; Yaowei Yan: The Pennsylvania State University; Xiao Liu: The Pennsylvania State University; Jun Huan: Baidu; Xiang Zhang: The Pennsylvania State University

361 **How to count triangles, without seeing the whole graph**
Suman Kalyan Bera: UC Santa Cruz; C. Seshadhri: University of California, Santa Cruz

714 **Personalized PageRank to a Target Node, Revisited**
Hanzhi Wang: Renmin University of China; Zhewei Wei: Renmin University of China; Junhao Gan: University of Melbourne; Sibo Wang: The Chinese University of Hong Kong; Zengfeng Huang: Fudan University

Mining Text, Web, Social Media 1

239 **NodeAug: Semi-Supervised Node Classification with Data Augmentation**
Yiwei Wang: National University of Singapore; Wei Wang: National University of Singapore; Yuxuan Liang: National University of Singapore; Yujun Cai: Nanyang Technological University; Juncheng Liu: National University of Singapore; Bryan Hooi: National University of Singapore

744 **Finding Effective Geo-social Group for Impromptu Activities with Diverse Demands**
Lu Chen: Swinburne University of Technology; Chengfei Liu: Swinburne University of Technology; Rui Zhou: Swinburne University of Technology; Jiajie Xu: Soochow University; Jeffrey Xu Yu: The Chinese University of Hong Kong; Jianxin Li: Deakin University

1019 **STEAM: Self-Supervised Taxonomy Expansion via Path-Based Multi-View Co-Training**
Yue Yu: Georgia Institute of Technology; Yinghao Li: Georgia Institute of Technology; Jiaming Shen: University of Illinois at Urbana Champaign; Hao Feng: UESTC; Jimeng Sun: University of Illinois at Urbana Champaign; Chao Zhang: Georgia Institute of Technology

1047 **Correlation Networks for Extreme Multi-label Text Classification**
Guangxu Xun: University of Virginia; Kishlay Jha: University of Virginia; Jianhui Sun: University of Virginia; Aidong Zhang: University of Virginia

1859 **Graph Attention Networks over Edge Content-Based Channels**
Lu Lin: University of Virginia; Hongning Wang: University of Virginia

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Kuo Zhong: Graduate school at ShenZhen, Tsinghua university; Ying Wei: Tencent AI Lab; Chun Yuan: Graduate school at ShenZhen, Tsinghua university; Haoli Bai: The Chinese University of Hong Kong; Junzhou Huang: Tencent AI Lab

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Garrett Wilson: Washington State University; Janardhan Rao Doppa: Washington State University; Diane J. Cook: Washington State University

1875 **Multimodal Learning with Incomplete Modalities by Knowledge Distillation**

Qi Wang: Michigan State University; Liang Zhan: University of Pittsburgh; Paul Thompson: University of Southern California; Jiayu Zhou: Michigan State University

2210 **Semi-supervised Collaborative Filtering by Text-enhanced Domain Adaptation**

Wenhui Yu: Tsinghua University; Xiao Lin: Alibaba Group; Junfeng Ge: Alibaba Group; Wenwu Ou: Alibaba Group; Zheng Qin: Tsinghua University

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Jian Liang: Cloud and Smart Industries Group, Tencent, China; Bing Bai: Cloud and Smart Industries Group, Tencent, China; Yuren Cao: Cloud and Smart Industries Group, Tencent, China; Kun Bai: Cloud and Smart Industries Group, Tencent, China; Fei Wang: Cornell University

476 **XGNN: Towards Model-Level Explanations of Graph Neural Networks**

Hao Yuan: Texas A&M University; Jiliang Tang: Michigan State University; Xia Hu: Texas A&M University; Shuiwang Ji: Texas A&M University

1395 **xGAIL: Explainable Generative Adversarial Imitation Learning for Explainable Human Decision Analysis**

Menghai Pan: Worcester Polytechnic Institute; Weixiao Huang: Worcester Polytechnic Institute; Yanhua Li: Worcester Polytechnic Institute (WPI); Xun Zhou: University of Iowa; Jun Luo: Lenovo Group Limited

1578 **Diverse Rule Sets**

Guangyi Zhang: KTH Royal Institute of Technology; Aristides Gionis: KTH Royal Institute of Technology

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1107 **Retrospective Loss: Looking Back to Improve Training of Deep Neural Networks**

Surgan Jandial: IIT Hyderabad; Ayush Chopra: Media and Data Science Research Lab, Adobe; Mausoom Sarkar: Media and Data Science Research Lab, Adobe; Piyush Gupta: Media and Data Science Research Lab, Adobe; Balaji Krishnamurthy: Media and Data Science Research Lab, Adobe; Vineeth Balasubramanian: IIT Hyderabad

1379 **A Novel Deep Learning Model by Stacking Conditional Restricted Boltzmann Machine and Deep Neural Network**

Tianyu Kang: University of Massachusetts Boston; Ping Chen: University of Massachusetts Boston; John Quackenbush: Harvard T.H. Chan School of Public Health; Wei Ding: University of Massachusetts Boston

1573 **Measuring Model Complexity of Neural Networks with Curve Activation Functions**

Xia Hu: Simon Fraser University and Microsoft Research Asia; Weiqing Liu: Microsoft Research Asia; Jiang Bian: Microsoft Research Asia; Jian Pei: Simon Fraser University

2115 **A Framework for Recommending Accurate and Diverse Items Using Bayesian Graph Convolutional Neural Networks**

Jianing Sun: Huawei Technologies Canada; Wei Guo: Huawei Noah's Ark Lab; Dengcheng Zhang: Huawei Distributed and Parallel Software Lab; Yingxue Zhang: Huawei Technologies Canada; Florence Robert-Regol: McGill University; Yaochen Hu: Huawei Technologies Canada; Huifeng Guo: Huawei Noah's Ark Lab; Ruiming Tang: Huawei Noah's Ark Lab; Han Yuan: Huawei Distributed and Parallel Software Lab; Xiuqiang He: Huawei Noah's Ark Lab; Mark Coates: McGill University

2336 **CurvaNet: Geometric Deep Learning based on Multi-scale Directional Curvature for 3D Shape Analysis**

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847 **Identifying Sepsis Subphenotypes via Time-Aware Multi-Modal Auto-Encoder**
Changchang Yin: The Ohio State University; Ruoqi Liu: The Ohio State University; Dongdong Zhang: The Ohio State University; Ping Zhang: The Ohio State University

950 **High-Dimensional Similarity Search with Quantum-Assisted Variational Autoencoder**
Nicholas Gao: NASA Ames Research Center; Max Wilson: NASA Ames Research Center; Thomas Vandal: NASA Ames Research Center; Walter Vinci: NASA Ames Research Center; Ramakrishna Nemani: NASA Ames Research Center; Eleanor Rieffel: NASA Ames Research Center

1706 **Node-Edge Co-disentangled Representation Learning for Attributed Graph Generation**
Xiaojie Guo: George Mason University; Liang Zhao: George Mason University; Zhao Qin: Syracuse University; Lingfei Wu: IBM Research AI; Amarda Shehu: George Mason University; Yanfang Ye: West Virginia University

2324 **Learning Stable Graphs from Heterogeneous Confounded Environments**
Yue He: Tsinghua University; Peng Cui: Tsinghua University; Jianxin Ma: Tsinghua University; Zou Hao: Tsinghua University; Xiaowei Wang: Alibaba; Hongxia Yang: Alibaba; Philip S. Yu: University of Illinois at Chicago IL, USA

Social Informatics

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Ruixiang Tang: Texas A&M University; Mengnan Du: Texas A&M University; Ninghao Liu: Texas A&M University; Fan Yang: Texas A&M University; Xia Hu: Texas A&M University

1613 **A Geometric Approach to Predicting Bounds of Downstream Model Performance**
Brian J. Goode: Virginia Tech; Debanjan Datta: Virginia Tech

1680 **Bridging the Gap between Superhuman AI and Human Behavior: Chess as a Model System**
Reid McIlroy-Young: University of Toronto; Siddhartha Sen: Microsoft Research; Jon Kleinberg: Cornell University; Ashton Anderson: University of Toronto

2083 **Scaling choice models of relational social data**
Jan Overgoor: Stanford University; George Pakapol Supaniratisai: Stanford University; Johan Ugander: Stanford University

2085 **Deep Exogenous and Endogenous Influence Combination for Social Chatter Intensity Prediction**
Subhabrata Dutta: IIIT-Delhi, India; Sarah Masud: IIIT-Delhi, India; Soumen Chakrabarti: IIT Bombay, India; Tanmoy Chakraborty: IIIT-Delhi, India

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Ang Li: Duke University; Yixiao Duan: Beihang University; Huanrui Yang: Duke University; Yiran Chen: Duke University; Jianlei Yang: Beihang University

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Pan Peng: Department of Computer Science, University of Sheffield, Sheffield, U.K.; Yuichi Yoshida: National Institute of Informatics

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Thien Q. Tran: University of Tsukuba; Kazuto Fukuchi: University of Tsukuba; Youhei Akimoto: University of Tsukuba; Jun Sakuma: University of Tsukuba

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586 **Geodesic Forests**

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665 **Mining large quasi-cliques with quality guarantees from vertex neighborhoods**

Aritra Konar: University of Virginia; Nicholas Sidiropoulos: University of Virginia

1707 **Minimizing Localized Ratio Cut Objectives in Hypergraphs**

Nate Veldt: Cornell University; Austin Benson: Cornell University; Jon Kleinberg: Cornell University

Session 3

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585 **MultiImport: Inferring Node Importance in a Knowledge Graph from Multiple Input Signals**

Namyong Park: Carnegie Mellon University; Andrey Kan: Amazon; Xin Luna Dong: Amazon; Tong Zhao: Amazon; Christos Faloutsos: Carnegie Mellon University and Amazon

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2297 MCRapper: Monte-Carlo Rademacher Averages for Poset Families and Approximate Pattern Mining
Leonardo Pellegrina: University of Padova; Cyrus Cousins: Brown University; Fabio Vandin: University of Padova; Matteo Riondato: Amherst College

Healthcare and Health Informatics 1

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Muhan Zhang: Washington University in St. Louis; Christopher King: Washington University in St. Louis; Michael Avidan: Washington University in St. Louis; Yixin Chen: Washington University in St. Louis

527 INPREM: An Interpretable and Trustworthy Predictive Model for Healthcare
Xianli Zhang: Xi'an Jiaotong University; Buyue Qian: Xi'an Jiaotong University; Shilei Cao: Tencent Jarvis Lab; Yang Li: Xi'an Jiaotong University; Hang Chen: Xi'an Jiaotong University; Yefeng Zheng: Tencent Jarvis Lab; Ian Davidson: University of California - Davis

583 DETERRENT: Knowledge Guided Graph Attention Network for Detecting Healthcare Misinformation
Limeng Cui: The Pennsylvania State University; Haeseung Seo: The Pennsylvania State University; Maryam Tabar: The Pennsylvania State University; Fenglong Ma: The Pennsylvania State University; Suhang Wang: The Pennsylvania State University; Dongwon Lee: The Pennsylvania State University

685 MoFlow: An Invertible Flow Model for Generating Molecular Graphs
Chengxi Zang: Cornell University; Fei Wang: Cornell University

707 HiTANet: Hierarchical Time-Aware Attention Networks for Risk Prediction on Electronic Health Records
Junyu Luo: The Pennsylvania State University; Muchao Ye: The Pennsylvania State University; Cao Xiao: IQVIA; Fenglong Ma: The Pennsylvania State University

Meta-learning and Automated ML

804 AutoST: Efficient Neural Architecture Search for Spatio-Temporal Prediction
Ting Li: JD Intelligent Cities Business Unit; Junbo Zhang: JD Intelligent Cities Business Unit; Kainan Bao: south west jiaotong university; Yuxuan Liang: School of Computing, National University of Singapore; Yexin Li: Yexin Li Hong Kong University of Science and Technology; Yu Zheng: JD Intelligent Cities Business Unit

820 AutoGrow: Automatic Layer Growing in Deep Convolutional Networks
Wei Wen: Duke University; Feng Yan: University of Nevada - Reno; Yiran Chen: Duke University; Hai Li: Duke University

941 Towards Automated Neural Interaction Discovering for Click-Through Rate Prediction
Qingquan Song: Texas A&M University; Dehua Cheng: Facebook Inc.; Eric Zhou: Facebook Inc.; Jiyan Yang: Facebook Inc.; Yuandong Tian: Facebook Inc.; Xia Hu: Texas A&M University

1511 AutoML Pipeline Selection: Efficiently Navigating the Combinatorial Space
Chengrun Yang: Cornell University; Jicong Fan: Cornell University; Ziyang Wu: Cornell University; Madeleine Udell: Cornell University

1599 Meta-learning on Heterogeneous Information Networks for Cold-start Recommendation
Yuanfu Lu: Beijing University of Posts and Telecommunications; Yuan Fang: Singapore Management University; Chuan Shi: Beijing University of Posts and Telecommunications

1775 Task-Adaptive Graph Meta-learning
Qiuling Suo: University at buffalo; Jingyuan Chou: University of Virginia; Weida Zhong: University at Buffalo; Aidong Zhang: University of Virginia

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622 WeightGrad: Geo-Distributed Data Analysis Using Quantization for Faster Convergence and Better Accuracy
Syeda Nahida Akter: Bangladesh University of Engineering and Technology; Muhammad Abdullah Adnan: University of California San Diego

725 Edge-consensus Learning: Deep Learning on P2P Networks with Nonhomogeneous Data
Kenta Niwa: NTT Corporation; Noboru Harada: NTT Corporation; Guoqiang Zhang: University Technology of Sydney; Bastiaan Kleijn: Victoria University of Wellington

1292 FedFast: Going Beyond Average for Faster Training of Federated Recommender Systems
Khalil Muhammad: Insight Centre for Data Analytics, University College Dublin; Qinqin Wang: Insight Centre for Data Analytics, University College Dublin; Diarmuid O' Reilly-Morgan: Insight Centre for Data Analytics, University College Dublin; Elias Tragos: Insight Centre for Data Analytics, University College Dublin; Barry Smyth: Insight Centre for Data Analytics, University College Dublin; Neil Hurley: Insight Centre for Data Analytics, University College Dublin; James Geraci: Samsung Electronics; Aonghus Lawlor: Insight Centre for Data Analytics, University College Dublin

1738 ALO-NMF: Accelerated Locality-Optimized Non-negative Matrix Factorization
Gordon Moon: Sandia National Laboratories; J. Austin Ellis: Sandia National Laboratories; Aravind Sukumaran-Rajam: Washington State University; Srinivasan Parthasarathy: The Ohio State University; P. Sadayappann: University of Utah

Research Papers

2249 Rich Information is Affordable: A Systematic Performance Analysis of Second-order Optimization Using K-FAC

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122 An Efficient Neighborhood-based Interaction Model for Recommendation on Heterogeneous Graph

Jiarui Jin: Shanghai Jiao Tong University; Jiarui Qin: Shanghai Jiao Tong University; Yuchen Fang: Shanghai Jiao Tong University; Kounianhua Du: Shanghai Jiao Tong University; Weinan Zhang: Shanghai Jiao Tong University; Yong Yu: Shanghai Jiao Tong University; Zheng Zhang: Amazon; Alexander Smola: Amazon

222 Compositional Embeddings Using Complementary Partitions for Memory-Efficient Recommendation Systems

Hao-Jun Shi: Northwestern University; Dheevatsa Mudigere: Facebook; Maxim Naumov: Facebook; Jiyan Yang: Facebook

391 Learning Transferrable Parameters for Long-tailed Sequential User Behavior Modeling

Jianwen Yin: zhejiang university; Chenghao Liu: Singapore Management University; Weiqing Wang: Monash University; Jianling Sun: Zhejiang University; Steven C.H. Hoi: Salesforce Research Asia

581 Disentangled Self-Supervision in Sequential Recommenders

Jianxin Ma: Alibaba Group; Tsinghua University; Chang Zhou: Alibaba Group; Hongxia Yang: Alibaba Group; Cui Peng: Tsinghua University; Xin Wang: Tsinghua University; Wenwu Zhu: Tsinghua University

739 MAMO: Memory-Augmented Meta-Optimization for Cold-start Recommendation

Manqing Dong: University of New South Wales; Feng Yuan: University of New South Wales; Lina Yao: University of New South Wales; Xiwei Xu: Data 61; Liming Zhu: Data 61

Reinforcement Learning

448 Recurrent Networks for Guided Multi-Attention Classification

Xin Dai: Worcester Polytechnic Institute; Xiangnan Kong: Worcester Polytechnic Institute; Tian Guo: Worcester Polytechnic Institute; John Lee: Worcester Polytechnic Institute; Xinyue Liu: Worcester Polytechnic Institute; Constance Moore: University of Massachusetts Medical School

535 Malicious Attacks against Deep Reinforcement Learning Interpretations

Mengdi Huai: University of Virginia; Jianhui Sun: University of Virginia; Renqin Cai: University of Virginia; Liuyi Yao: University of New York at Buffalo; Aidong Zhang: University of Virginia

893 Robust Detection of Adaptive Spammers by Nash Reinforcement Learning

Yingtong Dou: University of Illinois at Chicago; Guixiang Ma: Intel Labs; Philip S. Yu: University of Illinois at Chicago; Sihong Xie: Lehigh University

1464 Recurrent Halting Chain for Early Multi-label Classification

Thomas Hartvigsen: Worcester Polytechnic Institute; Cansu Sen: Worcester Polytechnic Institute; Xiangnan Kong: Worcester Polytechnic Institute; Elke Rundensteiner: Worcester Polytechnic Institute

2159 DeepLine: AutoML Tool for Pipelines Generation using Deep Reinforcement Learning and Hierarchical Actions Filtering

Yuval Heffetz: Ben Gurion University; Roman Vainshtein: Ben Gurion University; Gilad Katz: Ben Gurion University; Lior Rokach: Ben Gurion University

Session 4

Oral Presentation - Wed 10 AM-12 PM **I Poster Q&A Sessions -** Tue 6-7 PM & Wed 6-7 AM

Adversarial Learning

110 Graph Structure Learning for Robust Graph Neural Networks

Wei Jin: Michigan State University; Yao Ma: Michigan State University; Xiaorui Liu: Michigan State University; Xianfeng Tang: Pennsylvania State University; Suhang Wang: Pennsylvania State University; Jiliang Tang: Michigan State University

462 Vulnerability vs. Reliability: Disentangled Adversarial Examples for Cross-Modal Learning

Chao Li: Xidian University; Haoteng Tang: University of Pittsburgh; Cheng Deng: Xidian University; Liang Zhan: University of Pittsburgh; Wei Liu: Tencent

1478 Attackability Characterization of Adversarial Evasion Attack on Discrete Data

Yutong Wang: King Abdullah University of Science and Technology; Yufei Han: NortonLifelock Research Group; Hongyan Bao: King Abdullah University of Science and Technology; Yun Shen: NortonLifelock Research Group; Fenglong Ma: Penn State University; Jin Li: Guangzhou Univeristy; Xiangliang Zhang: King Abdullah University of Science and Technology

1661 Certifiable Robustness of Graph Convolutional Networks under Structure Perturbations

Daniel Zügner: Technical University of Munich; Stephan Günnemann: Technical University of Munich

Research Papers

1731 **RayS: A Ray Searching Method for Hard-label Adversarial Attack**
Jinghui Chen: University of California, Los Angeles; Quanquan Gu: University of California, Los Angeles

Dimensionality Reduction

1245 **Block Model Guided Unsupervised Feature Selection**
Zilong Bai: University of California, Davis; Hoa Nguyen: University of California, Davis; Ian Davidson: University of California, Davis

1532 **Leveraging Model Inherent Variable Importance for Stable Online Feature Selection**
Johannes Haug: University of Tuebingen; Martin Pawelczyk: University of Tuebingen; Klaus Broelemann: Schufa Holding AG; Gjergji Kasneci: University of Tuebingen

1628 **LogPar: Logistic PARAFAC2 Factorization for Temporal Binary Data with Missing Values**
Kejing Yin: Hong Kong Baptist University; Ardavan Afshar: Georgia Institute of Technology; Joyce Ho: Emory University; William Cheung: Hong Kong Baptist University; Chao Zhang: Georgia Institute of Technology; Jimeng Sun: University of Illinois Urbana-Champaign

1722 **Hyperbolic Distance Matrices**
Puoya Tabaghi: University of Illinois at Urbana-Champaign; Ivan Dokmanić: University of Basel

2140 **Tight Sensitivity Bounds For Smaller Coresets**
Alaa Maalouf: University of Haifa; Adiel Statman: University of Haifa; Dan Feldman: University of Haifa

Mining Text, Web, Social Media 2

1037 **BOND: Bert-Assisted Open-Domain Named Entity Recognition with Distant Supervision**
Chen Liang: Georgia Institute of Technology; Yue Yu: Georgia Institute of Technology; Haoming Jiang: Georgia Institute of Technology; Siawpeng Er: Georgia Institute of Technology; Ruijia Wang: Georgia Institute of Technology; Tuo Zhao: Georgia Institute of Technology; Chao Zhang: Georgia Institute of Technology

1067 **FreeDOM: A Transferable Neural Architecture for Structured Information Extraction on Web Documents**
Bill Yuchen Lin: University of Southern California; Ying Sheng: Google; Nguyen Vo: Google; Sandeep Tata: Google

1157 **HGCN: A Heterogeneous Graph Convolutional Network-Based Deep Learning Model Toward Collective Classification**
Zhihua Zhu: Institute of Computing Technology, Chinese Academy of Sciences, Beijing, China; Xinxin Fan: Institute of Computing Technology, Chinese Academy of Sciences, Beijing, China; Xiaokai Chu: Institute of Computing Technology, Chinese Academy of Sciences, Beijing, China; Jingping Bi: Institute of Computing Technology, Chinese Academy of Sciences, Beijing, China

1608 **Dynamic Knowledge Graph based Multi-Event Forecasting**
Songgaojun Deng: Stevens Institute of Technology; Huzefa Rangwala: George Mason University; Yue Ning: Stevens Institute of Technology

1716 **Reciptor: An Effective Pretrained Model for Recipe Representation Learning**
Diya Li: Rensselaer Polytechnic Institute; Mohammed Zaki: Rensselaer Polytechnic Institute

Probabilistic Inference

125 **Directional Multivariate Ranking**
Nan Wang: University of Virginia; Hongning Wang: University of Virginia

781 **Learning Opinion Dynamics From Social Traces**
Corrado Monti: ISI Foundation; Gianmarco De Francisci Morales: ISI Foundation; Francesco Bonchi: Fondazione ISI

784 **BLOB: A Probabilistic Model for Recommendation that Combines Organic and Bandit Signals**
Otmane Sakhi: Criteo; Stephen Bonner: Durham University; David Rohde: Criteo; Flavian Vasile: Criteo

852 **A causal look at statistical definitions of discrimination**
Elias Chaibub Neto: Sage Bionetworks

1303 **Discovering Approximate Functional Dependencies using Smoothed Mutual Information**
Frédéric Pennerath: CentraleSupélec; Panagiotis Mandros: Max-Planck-Institut für Informatik; Jilles Vreeken: CISPA Helmholtz Center for Information Security

Recommender Systems 2

843 **Incremental Mobile User Profiling: Reinforcement Learning with Spatial Knowledge Graph for Modeling Event Streams**
Pengyang Wang: University of Central Florida; Kunpeng Liu: University of Central Florida; Lu Jiang: Northeast Normal University; Yanjie Fu: University of Central Florida; Xiaolin Li: Nanjing University

Research Papers

985 **Improving Conversational Recommender Systems via Knowledge Graph based Semantic Fusion**
Kun Zhou: Peking University; Xin Zhao: Renmin University of China, School of Information; Shuqing Bian: Renmin University of China; Yuanhang Zhou: Xidian University; Ji-Rong Wen: Renmin University; Jingsong Yu: Peking University

1020 **Probabilistic Metric Learning with Adaptive Margin for Top-K Recommendation**
Chen Ma: McGill University; Liheng Ma: McGill University; Yingxue Zhang: Huawei Technologies Canada; Ruiming Tang: Huawei Noah's Ark Lab; Xue Liu: McGill University; Mark Coates: McGill University

1250 **Joint Policy-Value Learning for Recommendation**
Olivier Jeunen: University of Antwerp; David Rohde: Criteo; Flavian Vasile: Criteo; Martin Bompaire: Criteo

1562 **Multi-level Graph Convolutional Networks for Cross-platform Anchor Link Prediction**
Hongxu Chen: University of Technology Sydney; Hongzhi Yin: The University of Queensland; Xiangguo Sun: Southeast University; Tong Chen: The University of Queensland; Bogdan Gabrys: University of Technology Sydney; Katarzyna Musial: University of Technology Sydney

Unsupervised Learning 2

1380 **InfiniteWalk: Deep Network Embeddings as Laplacian Embeddings with a Nonlinearity**
Sudhanshu Chanpuriya: University of Massachusetts Amherst; Cameron Musco: University of Massachusetts Amherst

1407 **Catalysis Clustering With GAN By Incorporating Domain Knowledge**
Olga Andreeva: University of Massachusetts Boston; Wei Li: Wuhan University; Wei Ding: University of Massachusetts Boston; Marieke Kuijjer: Centre for Molecular Medicine Norway, University of Oslo; John Quackenbush: Dana-Farber Cancer Institute; Ping Chen: University of Massachusetts Boston

1455 **In and Out: Optimizing Overall Interaction in Probabilistic Graphs under Clustering Constraints**
Domenico Mandaglio: University of Calabria; Andrea Tagarelli: University of Calabria; Francesco Gullo: UniCredit

1492 **Unsupervised Differentiable Multi-aspect Node Representation Learning**
Chanyoung Park: University of Illinois at Urbana-Champaign; Carl Yang: University of Illinois at Urbana-Champaign; Qi Zhu: University of Illinois at Urbana-Champaign; Donghyun Kim: Yahoo Research; Hwanjo Yu: POSTECH; Jiawei Han: University of Illinois at Urbana-Champaign

1800 **Unsupervised Paraphrasing via Deep Reinforcement Learning**
Muhammad Abu Bakar Siddique: University of California, Riverside; Samet Oymak: University of California, Riverside; Vagelis Hristidis: University of California, Riverside

Session 5

Oral Presentation - Wed 1:30-3:30 PM **I Poster Q&A Sessions -** Tue 7-8 PM & Wed 7-8 AM

Graph Mining 2

223 **Structural Patterns and Generative Models of Real-world Hypergraphs**
Manh Tuan Do: Korea Advanced Institute of Science and Technology; Se-eun Yoon: Korea Advanced Institute of Science and Technology; Bryan Hooi: National University of Singapore; Kijung Shin: Korea Advanced Institute of Science and Technology

759 **Estimating Properties of Social Networks via Random Walk considering Private Nodes**
Kazuki Nakajima: Tokyo Institute of Technology; Kazuyuki Shudo: Tokyo Institute of Technology

959 **Adaptive Graph Encoder for Attributed Graph Embedding**
Ganqu Cui: Tsinghua University; Jie Zhou: Tsinghua University; Cheng Yang: Beijing University of Posts and Telecommunications; Zhiyuan Liu: Tsinghua University

962 **NetTrans: Neural Cross-Network Transformation**
Si Zhang: University of Illinois Urbana-Champaign; Hanghang Tong: University of Illinois Urbana-Champaign; Yinglong Xia: Facebook; Liang Xiong: Facebook; Jiejun Xu: HRL Laboratories, LLC.

1318 **HOPS: Probabilistic Subtree Mining for Small and Large Graphs**
Pascal Welke: University of Bonn; Florian Seiffarth: University of Bonn; Michael Kamp: Monash University; Stefan Wrobel: Fraunhofer IAIS & Univ. of Bonn

Graph Neural Networks

12 **Learning Effective Road Network Representation with Hierarchical Graph Neural Networks**
Ning Wu: Beihang University; Xin Zhao: Renmin University of China; Jingyuan Wang: Beihang University; Dayan Pan: Beihang University

774 **Connecting the Dots: Multivariate Time Series Forecasting with Graph Neural Networks**
Zonghan Wu: University of Technology Sydney; Shirui Pan: Monash University; Guodong Long: University of Technology Sydney; Jing Jiang: University of Technology Sydney; Xiaojun Chang: Monash University; Chengqi Zhang: University of Technology Sydney

971 **Redundancy-Free Computation for Graph Neural Networks**
Zhihao Jia: Stanford Universiity; Sina Liin: Microsoft; Rex Ying: Stanford University; Jiaxuan You: Stanford University; Alexandra Porter: Stanford University; Jure Leskovec: Stanford University; Alex Aiken: Stanford University

1467 **Minimal Variance Sampling with Provable Guarantees for Fast Training of Graph Neural Networks**
Weilin Cong: The Pennsylvania State University; Rana Forsati: Microsoft Bing; Mahmut Kandemir: The Pennsylvania State University; Mehrdad Mahdavi: The Pennsylvania State University

Research Papers

1903 **GPT-GNN: Generative Pre-Training of Graph Neural Networks**
Ziniu Hu: University of California, Los Angeles; Yuxiao Dong: Microsoft; Kuansan Wang: Microsoft; Kai-Wei Chang: University of California, Los Angeles; Yizhou Sun: University of California, Los Angeles

Healthcare and Health Informatics 2

806 **COMPOSE: Cross-Modal Pseudo-Siamese Network for Patient Trial Matching**
Junyi Gao: IQVIA; Cao Xiao: IQVIA; Lucas Glass: IQVIA; Jimeng Sun: University of Illinois Urbana-Champaign

1583 **Deep State-Space Generative Model For Correlated Time-to-Event Predictions**
Yuan Xue: Google; Denny Zhou: Google; Nan Du: Google; Andrew Dai: Google; Zhen Xu: Google; Kun Zhang: Google; Claire Cui: Google

1618 **HOLMES: Health OnLine Model Ensemble Serving for Deep Learning Models in Intensive Care Units**
Shenda Hong: Georgia Institute of Technology; Yanbo Xu: Georgia Institute of Technology; Alind Khare: Georgia Institute of Technology; Satria Priambada: Georgia Institute of Technology; Kevin Maher: Children's Healthcare of Atlanta; Alaa Aljiffry: Children's Healthcare of Atlanta; Jimeng Sun: University of Illinois Urbana-Champaign; Alexey Tumanov: Georgia Institute of Technology

1693 **Heidegger: Interpretable Temporal Causal Discovery**
Mehrdad Mansouri: Simon Fraser University; Ali Arab: Simon Fraser University; Zahra Zohrevand: Simon Fraser University; Martin Eser: Simon Fraser University

2021 **Treatment Policy Learning in Multiobjective Settings with Fully Observed Outcomes**
Soorajnath Boominathan: Massachusetts Institute of Technology; Michael Oberst: Massachusetts Institute of Technology; Helen Zhou: Carnegie Mellon University; Sanjat Kanjilal: Harvard Medical School and Harvard Pilgrim Healthcare Institute, Department of Population Medicine; David Sontag: Massachusetts Institute of Technology

Mining Spatial, Temporal Data

49 **Preserving Dynamic Attention for Long-Term Spatial-Temporal Prediction**
Haoxing Lin: University of Macau; Rufan Bai: University of Macau; Weijia Jia: University of Macau; Xinyu Yang: University of Macau; Yongjian You: Shanghai Jiao Tong University

445 **A Data Driven Graph Generative Model for Temporal Interaction Networks**
Dawei Zhou: University of Illinois at Urbana-Champaign; Lecheng Zheng: University of Illinois at Urbana-Champaign; Jiawei Han: University of Illinois at Urbana-Champaign; Jingrui He: University of Illinois at Urbana-Champaign

611 **Z-Miner: an efficient method for mining frequent arrangements of event intervals**
Zed Lee: Stockholm University; Tony Lindgren: Stockholm University; Panagiotis Papapetrou: Stockholm University

750 **Representing Temporal Attributes for Schema Matching**
Yinan Mei: Tsinghua University; Shaoxu Song: Tsinghua University; Yunsu Lee: Samsung Research; Jungho Park: Samsung Research; Soo-Hyung Kim: Samsung Research; Sungmin Yi: Samsung Research

828 **Curb-GAN: Conditional Urban Traffic Estimation through Spatio-Temporal Generative Adversarial Networks**
Yingxue Zhang: Worcester Polytechnic Institute; Yanhua Li: Worcester Polytechnic Institute; Xun Zhou: University of Iowa; Xiangnan Kong: Worcester Polytechnic Institute; Jun Luo: Lenovo Group Limited

2342 **Attentional Multi-graph Convolutional Network for Regional Economy Prediction with Open Migration Data**
Fengli Xu: Tsinghua University; Yong Li: Tsinghua University; Shusheng Xu: Tsinghua University

Online Learning / Bandits

373 **From Online to Non-i.i.d. Batch Learning**
Yufei Tao: The Chinese University of Hong Kong; Shangqi Lu: The Chinese University of Hong Kong

889 **Generic Outlier Detection in Multi-Armed Bandit**
Yikun Ban: University of Illinois at Urbana-Champaign; Jingrui He: University of Illinois at Urbana-Champaign

954 **Off-policy Bandits with Deficient Support**
Noveen Sachdeva: IIIT Hyderabad; Yi Su: Cornell University; Thorsten Joachims: Cornell University

1773 **Counterfactual Evaluation of Slate Recommendations with Sequential Reward Interactions**
James McInerney: Netflix; Brian Brost: Spotify; Praveen Chandar: Spotify; Rishabh Mehrotra: Spotify; Ben Carterette: Spotify

2014 **Combinatorial Black-Box Optimization with Expert Advice**
Hamid Dadkhahi: IBM Research; Karthikeyan Shanmugam: IBM Research; Jesus Rios: IBM Research; Payel Das: IBM Research; Samuel Hoffman: IBM Research; Troy David Loeffler: ANL; Subramanian Sankaranarayanan: UIC

Research Papers

Optimization and Theory

204 **Rethinking Pruning for Accelerating Deep Inference At the Edge**
Dawei Gao: Beihang University; Xiaoxi He: ETH Zürich; Zimu Zhou: Singapore Management University; Yongxin Tong: Beihang University; Ke Xu: Beihang University; Lothar Thiele: ETH Zürich

309 **A Block Decomposition Algorithm for Sparse Optimization**
Ganzhao Yuan: Peng Cheng Laboratory; Li Shen: Tencent AI LAB; Weishi Zheng: Sun Yat-sen University

533 **PolicyGNN: Aggregation Optimization for Graph Neural Networks**
Kwei Herng Lai: Texas A&M University; Daochen Zha: Texas A&M University; Kaixiong Zhou: Texas A&M University; Xia Hu: Texas A&M University

681 **AutoShuffleNet: Learning Permutation Matrices via an Exact Lipschitz Continuous Penalty in Deep Convolutional Neural Networks**
Jiancheng Lyu: Qualcomm; Shuai Zhang: Qualcomm; Yingyong Qi: Qualcomm; Jack Xin: University of California, Irvine

1346 **The NodeHopper: Enabling low latency ranking with constraints via a fast dual solver**
Ivan Lobov: DeepMind; Krishnamurthy Dj Dvijotham: DeepMind; Anton Zhernov: DeepMind; Dan A. Calian: DeepMind; Michelle Gong: DeepMind; Timothy A. Mann: DeepMind; Natarajan Chandrashekar: Google

Session 6

Oral Presentation - Thu 10 AM-12 PM **I Poster Q&A Sessions -** Wed 5-6 PM & Thu 5-6 AM

Data Mining Methods

874 **Neural Dynamics on Complex Networks**
Chengxi Zang: Cornell University; Fei Wang: Cornell University

929 **Mining Persistent Activity in Continually Evolving Networks**
Caleb Belth: University of Michigan; Xinyi Zheng: University of Michigan; Danai Koutra: University of Michigan

1579 **Vamsa: Automated Provenance Tracking in Data Science Scripts**
Mohammad Hossein Namaki: Washington State University; Avrilia Floratou: Microsoft; Fotis Psallidas: Microsoft; Subru Krishnan: Microsoft; Ashvin Agrawal: Microsoft; Yinghui Wu: Case Western Reserve University; Yiwen Zhu: Microsoft; Markus Weimer: Microsoft

1669 **Understanding Negative Sampling in Graph Representation Learning**
Zhen Yang: Department of Computer Science and Technology, Tsinghua University; Ming Ding: Department of Computer Science and Technology, Tsinghua University; Chang Zhou: DAMO Academy, Alibaba Group; Hongxia Yang: DAMO Academy, Alibaba Group; Jingren Zhou: DAMO Academy, Alibaba Group; Jie Tang: Department of Computer Science and Technology, Tsinghua University

2298 **REA: Robust Cross-lingual Entity Alignment Between Knowledge Graphs**
Shichao Pei: King Abdullah University of Science and Technology; Lu Yu: KAUST; Guoxian Yu: King Abdullah University of Science and Technology; Xiangliang Zhang: King Abdullah University of Science and Technology

Deep Sequence Modeling

182 **Attention and Memory-Augmented Networks for Dual-View Sequential Learning**
Yong He: Alibaba; Cheng Wang: Alibaba; Nan Li: Alibaba; Zhenyu Zeng: Alibaba

1165 **Handling Information Loss of Graph Neural Networks for Session-based Recommendation**
Tianwen Chen: The Hong Kong University of Science and Technology; Raymond Chi-Wing Wong: The Hong Kong University of Science and Technology

1376 **ST-SiameseNet: Spatio-Temporal Siamese Networks for Human Mobility Signature Identification**
Huimin Ren: Worcester Polytechnic Institute; Menghai Pan: Worcester Polytechnic Institute; Yanhua Li: Worcester Polytechnic Institute; Xun Zhou: The University of Iowa; Jun Luo: Lenovo Group Limited

1524 **Towards physics-informed deep learning for turbulent flow prediction**
Rui Wang: Northeastern University; Karthik Kashinath: Lawrence Berkeley National Laboratory; Mustafa Mustafa: Lawrence Berkeley National Laboratory; Adrian Albert: Lawrence Berkeley National Laboratory; Rose Yu: Northeastern University

2054 **DeepSinger: Singing Voice Synthesis with Data Mined From the Web**
Yi Ren: Zhejiang University; Xu Tan: Microsoft; Tao Qin: Microsoft; Jian Luan: Microsoft STCA Xiaoice; Zhou Zhao: Zhejiang University; Tie-Yan Liu: Microsoft

Graph Mining 3

1039 **Graph Structural-topic Neural Network**
Qingqing Long: Peking University; Yilun Jin: The Hong Kong University of Science and Technology; Guojie Song: Room 2307 in Science Building Two, Peking University, Beijing, China; Yi Li: Peking University; Wei Lin: Alibaba Inc.

1074 **SEAL: Learning Heuristics for Community Detection with Generative Adversarial Networks**
Yao Zhang: Fudan University; Yun Xiong: Fudan University; Yun Ye: Ant Financial Services Group; Tengfei Liu: Ant Financial Services Group; Weiqiang Wang: Ant Financial Services Group; Yangyong Zhu: Fudan University; Philip S. Yu: UIC

Research Papers

1155 Graph Contrastive Coding for Structural Graph Representation Pre-Training
Jiezhong Qiu: Tsinghua University; Qibin Chen: Tsinghua University; Yuxiao Dong: Microsoft; Jing Zhang: Renmin University; Hongxia Yang: DAMO Academy, Alibaba Group; Ming Ding: Tsinghua University; Kuansan Wang: Microsoft; Jie Tang: Tsinghua University

1249 Data Compression as a Comprehensive Framework for Graph Drawing and Representation Learning
Claudia Plant: Research Group Data Mining, University of Vienna, ds:UniVie; Sonja Biedermann: University of Vienna; Christian Böhm: Ludwig Maximilian University of Munich

2027 Neural Subgraph Isomorphism Counting
Xin Liu: The Hong Kong University of Science and Technology; Haojie Pan: The Hong Kong University of Science and Technology; Mutian He: The Hong Kong University of Science and Technology; Yangqiu Song: The Hong Kong University of Science and Technology; Xin Jiang: Huawei Technologies Co. Ltd; Lifeng Shang: Huawei Technologies Co. Ltd

Non-parametric Methods

91 Kernel Assisted Learning for Personalized Dose Finding
Liangyu Zhu: North Carolina State University; Wenbin Lu: North Carolina State University; Michael R. Kosorok: University of North Carolina at Chapel Hill; Rui Song: North Carolina State University

695 Missing Value Imputation for Mixed Data via Gaussian Copula
Yuxuan Zhao: Cornell University; Madeleine Udell: Cornell University

807 Discovering Succinct Pattern Sets Expressing Co-Occurrence and Mutual Exclusivity
Jonas Fischer: Max Planck Institute for Informatics; Jilles Vreeken: CISPA Helmholtz Center for Information Security

1476 Discovering Functional Dependencies from Mixed-Type Data
Panagiotis Mandros: Max Planck Institute for Informatics; David Kaltenpoth: CISPA Helmholtz Center for Information Security; Mario Boley: Monash University; Jilles Vreeken: CISPA Helmholtz Center for Information Security

2258 Voronoi Graph Traversal in High Dimensions with Applications to Topological Data Analysis and Piecewise Linear Interpolation
Vladislav Polianskii: KTH Royal Institute of Technology; Florian T. Pokorny: KTH Royal Institute of Technology

Spectral Methods

300 SCE: Scalable Newtork Embedding from Sparsest Cut
Shengzhong Zhang: Fudan University; Zengfeng Huang: The University of New South Wales; Haicang Zhou: Fudan University; Ziang Zhou: Fudan University

383 Laplacian Change Point Detection for Dynamic Graphs
Shenyang Huang: McGill University, Quebec Institute for Artificial Intelligence (Mila); Yasmeen Hitti: McGill University, Quebec Institute for Artificial Intelligence (Mila); Guillaume Rabusseau: University of Montreal, Quebec Institute for Artificial Intelligence (Mila); Reihaneh Rabbany: McGill University, Quebec Institute for Artificial Intelligence (Mila)

505 CAST: A Correlation-based Adaptive Spectral Clustering Algorithm on Multi-scale Data
Xiang Li: The University of Hong Kong; Ben Kao: The University of Hong Kong; Caihua Shan: The University of Hong Kong; Dawei Yin: JD.com; Martin Ester: Simon Fraser University

1481 Shengmin Jin: Syracuse University; Reza Zafarani: Syracuse University
Shengmin Jin: Syracuse University; Reza Zafarani: Syracuse University

2033 Hypergraph Clustering Based on PageRank
Yuuki Takai: RIKEN Center for Advanced Intelligence Project / Department of Mathematics, Keio University; Atsushi Miyauchi: RIKEN AIP; Masahiro Ikeda: RIKEN; Yuichi Yoshida: National Institute of Informatics

Unsupervised Learning 3

1809 CICLAD: A Fast and Memory-efficient Closed Itemset Miner for Streams
Tomas Martin: UQAM; Petko Valtchev: UQAM; Guy Francoeur: UQAM

1927 Parameterized Correlation Clustering in Hypergraphs and Bipartite Graphs
Nate Veldt: Cornell University; David F. Gleich: Purdue University; Anthony Wirth: The University of Melbourne

1954 A Non-Iterative Quantile Change Detection Method in Mixture Model with Heavy-Tailed Components
Yuantong Li: Purdue University; Qi Ma: North Carolina State University; Sujit Ghosh: North Carolina State University

2133 Learning Based Distributed Tracking
Hao Wu: The University of Melbourne; Junhao Gan: The University of Melbourne; Rui Zhang: The University of Melbourne

Research Papers

2315 **Stable Learning via Differentiated Variable Decorrelation**
Zheyean Shen: Tsinghua University; Peng Cui: Tsinghua University; Jiashuo Liu: Tsinghua University; Tong Zhang: Hong Kong University of Science and Technology; Bo Li: Tsinghua University; Zhitang Chen: Huawei Noah's Ark Lab

Session 7

Oral Presentation - Thu 1:30-3:30 PM **I Poster Q&A Sessions -** Wed 6-7 PM & Thu 6-7 AM

Big Data and Large Scale Methods

226 **Efficient Algorithm for the b-Matching Graph**
Yasuhiro Fujiwara: NTT; Atsutoshi Kumagai: NTT; Sekitoshi Kanai: NTT; Yasutoshi Ida: NTT; Naonori Ueda: NTT

619 **Imputing Various Incomplete Attributes via Distance Likelihood Maximization**
Shaoxu Song: Tsinghua University; Yu Sun: Tsinghua University

638 **MinSearch: An Efficient Algorithm for Similarity Search under Edit Distance**
Haoyu Zhang: Indiana University Bloomington; Qin Zhang: Indiana University Bloomington

1879 **Estimating the Percolation Centrality of Large Networks through Pseudo-dimension Theory**
Andre Vignatti: UFPR; Murilo da Silva: UFPR; Alane de Lima: UFPR

2141 **GHashing: Semantic Graph Hashing for Approximate Similarity Search in Graph Databases**
Zongyue Qin: Peking University; Yunsheng Bai: University of California, Los Angeles; Yizhou Sun: University of California, Los Angeles

Data Mining Applications

127 **Truth Discovery against Strategic Sybil Attack in Crowdsourcing**
Yue Wang: Simon Fraser University; Ke Wang: Simon Fraser University; Chunyan Miao: Nanyang Technological University

782 **Enterprise Cooperation and Competition Analysis with Sign-Oriented Preference Network**
Guangrun Wang: Sun Yat-sen University; Guangcong Wang: Sun Yat-Sen University; Keze Wang: University of Le Dai: University of Science and Technology of China; Yu Yin: University of Science and Technology of China; Chuan Qin: University of Science and Technology of China; Tong Xu: University of Science and Technology of China; Xiangnan He: University of Science and Technology of China; Enhong Chen: University of Science and Technology of China; Hui Xiong: University of Science and Technology of China, Los Angeles; Xiaodan Liang: Sun Yat-sen University; Liang Lin: Sun Yat-Sen University

1310 **Competitive Analysis for Points of Interest**
Shuangli Li: University of Science and Technology of China; Jingbo Zhou: Baidu Inc.; Hao Liu: Business Intelligence Lab, Baidu Research; Xinjiang Lu: Baidu; Tong Xu: University of Science and Technology of China; Hui Xiong: the State University of New Jersey

1410 **Prediction and Profiling of Audience Competition for Online Television Series**
Peng Zhang: Alibaba Group; Chuanren Liu: University of Tennessee; Kefeng Ning: Alibaba Group; Wenxiang Zhu: Alibaba Group; Yu Zhang: Alibaba Group

1617 **Context-to-Session Matching: Utilizing Whole Session for Response Selection in Information-Seeking Dialogue Systems**
Zhenxin Fu: Peking University; Shaobo Cui: Alibaba Group; Mingyue Shang: Peking University; Feng Ji: DAMO Academy, Alibaba Group; Dongyan Zhao: Peking University; Haiqing Chen: Alibaba Group; Rui Yan: Peking University

Information Retrieval

356 **Grounding Visual Concepts for Multimedia Event Detection and Multimedia Event Captioning in Zero-shot Setting**
Zhihui Li: University of New South Wales; Xiaojun Chang: Monash University; Lina Yao: University of New South Wales; Shirui Pan: Monash University; Zongyuan Ge: Monash University; Huaxiang Zhang: Shandong Normal University

1570 **Evaluating Conversational Recommender Systems via User Simulation**
Shuo Zhang: University of Stavanger; Krisztian Balog: University of Stavanger

1607 **WavingSketch: An Unbiased and Generic Sketch for Finding Top-k Items in Data Streams**
Jizhou Li: Peking University Shenzhen Graduate School; Zikun Li: Peking University; Yifei Xu: Peking University; Shiqi Jiang: Peking University; Tong Yang: Peking University; Bin Cui: Peking University; Yafei Dai: Peking University; Gong Zhang: Huawei Technologies

1996 **Hierarchical Topic Mining via Joint Spherical Tree and Text Embedding**
Yu Meng: University of Illinois at Urbana-Champaign; Yunyi Zhang: University of Illinois at Urbana-Champaign; Jiaxin Huang: University of Illinois Urbana-Champaign; Yu Zhang: University of Illinois at Urbana-Champaign; Chao Zhang: Georgia Institute of Technology; Jiawei Han: University of Illinois at Urbana-Champaign

2152 **Algorithmic Aspects of Temporal Betweenness**
Sebastian Buß: TU Berlin; Hendrik Molter: TU Berlin; Rolf Niedermeier: TU Berlin; Maciej Rymar: TU Berlin

Research Papers

Mining Text, Web, Social Media 3

1885 TinyGNN: Learning Efficient Graph Neural Networks

Bencheng Yan: Tsinghua University; Chaokun Wang: Tsinghua University; Gaoyang Guo: Tsinghua University; Yunkai Lou: Tsinghua University

1951 Prioritized Restreaming Algorithms for Balanced Graph Partitioning

Amel Awadelkarim: Stanford University; Johan Ugander: Stanford University

2019 CoRel: Seed-Guided Topical Taxonomy Construction by Concept Learning and Relation Transferring

Jiaxin Huang: University of Illinois at Urbana-Champaign; Yiqing Xie: The Hong Kong University of Science and Technology; Yu Meng: University of Illinois at Urbana-Champaign; Yunyi Zhang: University of Illinois at Urbana-Champaign; Jiawei Han: University of Illinois at Urbana-Champaign

2158 Non-Linear Mining of Social Activities in Tensor Streams

Koki Kawabata: ISIR, Osaka University; Yasuko Matsubara: ISIR, Osaka University; Takato Honda: ISIR, Osaka University; Yasushi Sakurai: ISIR, Osaka University

2328 Fast R-STL: Efficient and Robust Seasonal-Trend Decompositionfor Time Series with Complex Patterns

Qingsong Wen: Alibaba Group U.S.; Zhe Zhang: Alibaba Group U.S.; Yan Li: Alibaba Group U.S.; Liang Sun: Alibaba Group U.S.

Recommender Systems 3

1733 On Sampled Metrics for Item Recommendation

Walid Krichene: Google; Steffen Rendle: Google

2091 Geography-Aware Sequential Location Recommendation

Defu Lian: University of Science and Technology of China; Yongji Wu: University of Science and Technology of China; Yong Ge: University of Arizona; Xing Xie: Microsoft Research Asia; Enhong Chen: University of Science and Technology of China

2093 Dual Channel Hypergraph Collaborative Filtering

Shuyi Ji: Tsinghua University; Yifan Feng: Xiamen University; Rongrong Ji: Xiamen University; Xibin Zhao: Tsinghua University; Wanwan Tang: Baidu, Inc.; Yue Gao: Tsinghua University

2142 Interactive Path Reasoning on Graph for Conversational Recommendation

Wenqiang Lei: National University of Singapore; Gangyi Zhang: University of Science and Technology of China; Xiangnan He: University of Science and Technology of China; Yisong Miao: National University of Singapore; Xiang Wang: National University of Singapore; Liang Chen: Sun Yat-Sen University; Tat-Seng Chua: National University of Singapore

2171 On Sampling Top-K Recommendation Evaluation

Dong Li: Kent State University; Ruoming Jin: Kent State University; Jing Gao: iLambda; Zhi Liu: iLambda

Semi-supervised Learning 2

1033 Re-identification Attack to Privacy-Preserving Data Analysis with Noisy Sample-Mean

Du Su: University of Illinois, Urbana-Champaign; Wenmiao Lu: Verizon Media; Hieu Tri Huynh: University of Illinois, Urbana-Champaign; Ziao Chen: University of Illinois, Urbana-Champaign; Yi Lu: University of Illinois at Urbana-Champaign

1137 Semi-Supervised Multi-Label Learning from Crowds via Deep Sequential Generative Model

Wanli Shi: Nanjing University of Information Science & Technology; Bin Gu: Nanjing University of Information Science & Technology; Xiang Li: University of Western Ontario; Victor S Sheng: Texas Tech University

1297 AM-GCN: Adaptive Multi-channel Graph Convolutional Networks

Xiao Wang: Beijing University of Posts and Telecommunications; Meiqi Zhu: Beijing University of Posts and Telecommunications; Deyu Bo: Beijing University of Posts and Telecommunications; Peng Cui: Tsinghua University; Chuan Shi: Beijing University of Posts and Telecommunications; Jian Pei: Simon Fraser University

1350 HGMF: Heterogeneous Graph-based Fusion for Multimodal Data with Incompleteness

Jiayi Chen: University of Virginia; Aidong Zhang: University of Virginia

1637 RECORD: Resource Constrained Semi-Supervised Learning under Distribution ShiftScaling choice models of relational social data

Lan-Zhe Guo: Nanjing University; Zhi Zhou: Nanjing University; Yu-Feng Li: Nanjing University

ADS Papers

Content Recommendation & Retrieval Systems

1001 MultiSage: Empowering GCN with Contextualized Multi-Embeddings on Web-Scale Multipartite Networks

Carl Yang: University of Illinois at Urbana Champaign; Aditya Pal: Pinterest; Andrew Zhai: Pinterest; Nikil Pancha: Pinterest; Jiawei Han: University of Illinois at Urbana Champaign; Chuck Rosenburg: Pinterest; Jure Leskovec: Pinterest

360 Temporal-Contextual Recommendation in Real-Time

Yifei Ma: amazon; Murali Balakrishnan Narayanaswamy: amazon; Haibin Lin: amazon; Hao Ding: amazon

500 PinnerSage: Multi-Modal User Embedding Framework for Recommendations at Pinterest

Aditya Pal: Pinterest; Pong Eksombatchai: Pinterest; Yitong Zhou: Pinterest; Bo Zhao: Pinterest; Chuck Rosenberg: Pinterest; Jure Leskovec: Pinterest

727 M2GRL: A Multi-task Multi-view Graph Representation Learning Framework for Web-scale Recommender Systems

Menghan Wang: Alibaba Group; Yujie Lin: Alibaba; Guli Lin: Alibaba; Keping Yang: Alibaba; Xiaoming Wu: Hong Kong Polytechnic University

829 Attribute-based Propensity for Unbiased Learning in Recommender Systems: Algorithm and Case Studies

Zhen Qin: Google; Suming J. Chen: University of California Los Angeles ; Donald Metzler: Google; Yongwoo Noh: Google; Jingzheng Qin: Google; Xuanhui Wang: Google

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872 Neural Input Search for Large Scale Recommendation Models

Manas Joglekar: Not Available; Cong Li: Google; Mei Chen: Google; Taibai Xu: Google; Xiaoming Wang: Google; Jay Adams: Google; Pranav Khaitan: Google; Jiahui Liu: Google; Quoc Le: Google

1668 Privileged Features Distillation at Taobao Recommendations

Chen Xu: Alibaba Inc; Quan Li: Alibaba Inc; Junfeng Ge: Alibaba Group; Jinyang Gao: Alibaba; Xiaoyong Yang: Alibaba Group; Changhua Pei: Tsinghua University; Fei Sun: Alibaba Inc; Jian Wu: Alibaba Inc; Hanxiao Sun: Alibaba Group; Wenwu Ou: Alibaba Inc

1550 Embedding-based Retrieval in Facebook Search

Jui-Ting Huang: Facebook; Ashish Sharma: Facebook; Shuying Sun: Facebook; Li Xia: Facebook; David Zhang: Facebook; Philip Pronin: Facebook; Janani Padmanabhan: Facebook; Giuseppe Ottaviano: Facebook; Linjun Yang: Facebook

888 Learning to Cluster Documents into Workspaces Using Large Scale Activity Logs

Weize Kong: Google; Michael Bendersky: Google; Marc Najork: Google; Brandon Vargo: Google; Mike Colagrosso: Google

1666 Calendar Graph Neural Networks for Modeling Time Structures in Spatiotemporal User Behaviors

Daheng Wang: University of Notre Dame; Meng Jiang: University of Notre Dame; Munira Syed: University of Notre Dame; Oliver Conway: Conde Nast; Vishal Juneja: Conde Nast; Sriram Subramanian: Conde Nast; Nitesh V. Chawla: University of Notre Dame

Advt & User Engagement

1243 Hubble: an Industrial System for Audience Expansion in Mobile Marketing

Chenyi Zhuang: Ant Financial Services Group; Ziqi Liu: Ant Financial Services Group; Zhiqiang Zhang: Ant Financial Services Group; Yize Tan: Ant Financial Services Group; Zhengwei Wu: Ant Financial Services Group; Zhining Liu: Ant Financial Services Group; Jianping Wei: Ant Financial Services Group; Jinjie Gu: Ant Financial Services Group; Guannan Zhang: Ant Financial Services Group; Jun Zhou: Ant Financial Services Group; Yuan Qi: Ant Financial Services Group

1296 Combo-Attention Network for Baidu Video Advertising

Tan Yu: Baidu; Yi Yang: Baidu; Yi Li: Baidu; Xiaodong Chen: Baidu; Mingming Sun: Baidu; Ping Li: Baidu

2086 AutoFIS: Automatic Feature Interaction Selection in Factorization Models for Click-Through Rate Prediction

Bin Liu: ByteDance; Chenxu Zhu: Shanghai Jiao Tong University; Guilin Li: Noah s Ark Lab Huawei ; Weinan Zhang: Shanghai Jiao Tong University; Jincai Lai: Noah s Ark Lab Huawei ; Ruiming Tang: Noah s Ark Lab Huawei ; Xiuqiang He: Noah s Ark Lab Huawei ; Zhengguo Li: Noah s Ark Lab Huawei ; Yong Yu: Shanghai Jiao Tong University

1301 Federated Doubly Stochastic Kernel Learning for Vertically Partitioned Data

Bin Gu: JD Finance America Corporation; Zhiyuan Dang: Xidian University; Xiang Li: Western University; Heng Huang: University of Pittsburgh JD Finance America Corporation

278 Knowing your FATE: Friendship, Action and Temporal Explanations for User Engagement Prediction on Social Apps

Xianfeng Tang: The Pennsylvania State University; Yozen Liu: Snap Inc.; Neil Shah: Snap Inc.; Xiaolin Shi: Snap Inc.; Prasenjit Mitra: The Pennsylvania State University; Suhang Wang: The Pennsylvania State University

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GIS

922 What is that Building? An End-to-end System for Building Recognition from Streetside Images
Chiqun Zhang: Microsoft; Dragomir Yankov: Microsoft; Chun-Ting Wu: Microsoft; Simon Shapiro: Microsoft; Jason Hong: Microsoft; Wei Wu: Microsoft

1418 Reconstruction and Decomposition of High-Dimensional Landscapes via Unsupervised Learning
Jing Lei: George Mason University; Nasrin Akhter: GGeorge Mason University; Wanli Qiao: George Mason University; Amarda Shehu: George Mason University

1422 Map Generation from Large Scale Incomplete and Inaccurate Data Labels
Rui Zhang: IBM T.J. Watson Research Center ; Wei Zhang: IBM T.J. Watson Research Center ; Conrad Albrecht: IBM T.J. Watson Research Center ; Xiaodong Cui: IBM T.J. Watson Research Center ; Ulrich Finkler: IBM T.J. Watson Research Center ; David Kung: IBM T.J. Watson Research Center ; Siyuan Lu: IBM T.J. Watson Research Center

1827 Learning instrument invariant characteristics for generating high-resolution global coral reef maps
Ata Akbari Asanjan: Universities Space Research Association; Kamalika Das: VMWare Inc.; Alan Li: NASA Ames; Ved Chirayath: NASA Ames; Juan Torres-Perez: NASA Ames; Soroosh Sorooshian: University of California Irvine

861 Cellular Network Radio Propagation Modeling with Deep Convolutional Neural Networks
Xin Zhang: Shenzhen Institute of Artificial Intelligence and Robotics for Society; Xiujun Shu: Peng Cheng Laboratory; Bingwen Zhang: Google LLC; Jie Ren: Huawei Technologies Co. Ltd. ; Lizhou Zhou: Huawei Technologies Co. Ltd. ; Xin Chen: Huawei Technologies Co. Ltd.

Big Data Infrastructure

1258 Scaling Graph Neural Networks with Approximate PageRank
Aleksandar Bojchevski: Technical University of Munich; Johannes Klicpera: Technical University of Munich; Bryan Perozzi: Google; Amol Kapoor: Google; Martin Blais: Google; Benedek Rozemberczki: The University of Edinburgh; Michal Lukasik: Google; Stephan Günnemann: Technical University of Munich

1494 Grale: Designing Networks for Graph Learning
Jonathan Halcrow: Google; Alexandru Mo_oi: Google; Sam Ruth: Google; Bryan Perozzi: Google

882 Building Continuous Integration Services for Machine Learning
Bojan Karla_: ETH Zurich; Matteo Interlandi: Microsoft; Cedric Renggli: ETH Zurich; Wentao Wu: Microsoft; Ce Zhang: ETH Zurich; Deepak Mukunthu Iyappan Babu: Microsoft; Jordan Edwards: Microsoft; Chris Lauren: Microsoft; Andy Xu: Microsoft; Markus Weimer: Microsoft

1311 To Tune or Not to Tune? In Search of Optimal Configurations for Data Analytics
Ayat Fekry: University of Cambridge Computer Laboratory ; Lucian Carata: University of Cambridge Computer Laboratory ; Thomas Pasquier: Bristol University; Andrew Rice: University of Cambridge Computer Laboratory ; Andy Hopper: University of Cambridge Computer Laboratory

1559 LUMOS: A library for diagnosing metric regressions for web-scale applications
Jamie Pool: Microsoft; Ebrahim Beyrami: Microsoft; Vishak Gopal: Microsoft; Jayant Gupchup: Microsoft; Jeff Rowland: HCL America Inc; Binlong Li: Microsoft; Pritesh Kanani: Microsoft; Ross Cutler: Microsoft; Johannes Gehrke: Microsoft; Ashkan Aazami: Microsoft

E-commerce

63 Octet: Online Catalog Taxonomy Enrichment with Self-Supervision
Yuning Mao: University of Illinois at Urbana Champaign; Tong Zhao: Amazon.com; Andrey Kan: Amazon.com; Chenwei Zhang: Amazon.com; Xin Luna Dong: Amazon.com; Christos Faloutsos: Carnegie Mellon University; Jiawei Han: University of Illinois at Urbana Champaign

1528 Automatic Validation of Textual Attribute Values in ECommerce Catalog by Learning with Limited Labeled Data
Yaqing Wang: University at Buffalo SUNY ; Yifan Ethan Xu: Amazon.com; Xian Li: Amazon.com; Xin Luna Dong: Amazon.com; Jing Gao: University at Buffalo

1749 GrokNet: Unified Computer Vision Model Trunk and Embeddings For Commerce
Sean Bell: Facebook; Yiqun Liu: Facebook; Sami Alsheikh: Facebook; Yina Tang: Facebook; Ed Pizzi: Facebook; Michael Henning: Facebook; Karun Singh: Facebook; Omkar Parkhi: Facebook; Fedor Borisyuk: Facebook

1990 Causal Meta-Mediation Analysis: Inferring Causality Between Online Metrics From Summary Statistics of Many Randomized Experiments
Zenan Wang: UC Berkeley; Xuan Yin: Etsy Inc.; Tianbo Li: Etsy Inc.; Liangjie Hong: Etsy Inc.

1545 CLARA: Confidence of Labels and Raters
Viet-An Nguyen: Facebook; Peibei Shi: Facebook; Jagdish Ramakrishnan: Facebook; Udi Weinsberg: Facebook; Henry C. Lin: Facebook; Steve Metz: Facebook; Neil Chandra: Facebook; Jane Jing: Facebook; Dimitris Kalimeris: Harvard University

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Transportation & Logistics

626 **Polestar: An Intelligent, Efficient and National-Wide Public Transportation Routing Engine**
Hao Liu: Business Intelligence Lab Baidu Research ; Ying Li: Baidu Inc.; Yanjie Fu: University of Central Florida; Huaibo Mei: Baidu Inc.; Jingbo Zhou: Business Intelligence Lab Baidu Research ; Xu Ma: Baidu Inc.; Hui Xiong: Business Intelligence Lab Baidu Research

1126 **HetETA: Heterogeneous Information Network Embedding for Estimating Time of Arrival**
Huiting Hong: AI Labs Didi Chuxing Beijing China ; Yucheng Lin: AI Labs Didi Chuxing Beijing China ; Xiaoqing Yang: AI Labs Didi Chuxing Beijing China ; Zang Li: AI Labs Didi Chuxing Beijing China ; Jieping Ye: AI Labs Didi Chuxing Beijing China ; Kun Fu: AI Labs Didi Chuxing Beijing China ; Zheng Wang: AI Labs Didi Chuxing Beijing China ; Xiaohu Qie: Technology Ecosystem Development Didi Chuxing Beijing China

1630 **Order Fulfillment Cycle Time Estimation for On-Demand Food Delivery**
Lin Zhu: Alibaba Group; Wei Yu: Alibaba Group; Kairong Zhou: Alibaba Group; Xing Wang: Alibaba Group; Pengyu Wang: Alibaba Group; Wenxing Feng: Alibaba Group; Ning Chen: Alibaba Group; Pei Lee: Alibaba Group

2138 **City Metro Network Expansion with Reinforcement Learning**
Yu Wei: Xi an Jiaotong University; Minjia Mao: Xi an Jiaotong University; Xi Zhao: Xi an Jiaotong University; Jianhua Zou: Xi an Jiaotong University; Ping An: Xi an Jiaotong University

860 **Predicting Individual Treatment Effects of Large-scale Team Competitions in a Ride-sharing Economy**
Teng Ye: University of Michigan Ann Arbor ; Wei Ai: University of Maryland College Park ; Lingyu Zhang: Didi Chuxing; Ning Luo: Didi Chuxing; Lulu Zhang: Didi Chuxing; Jieping Ye: Didi Chuxing; Qiaozhu Mei: University of Michigan Ann Arbor

713 **Improving Trajectory Predictions of Traffic Actors using GANs and Differentiable Rasterization**
Eason Wang: University of Waterloo; Henggang Cui: Uber ATG; Sai Yalamanchi: Uber ATG; Mohana Moorthy: Uber ATG; Nemanja Djuric: Uber ATG

Sports & Medicine

875 **Easy Perturbation EEG Algorithm for Spectral Importance (easyPEASI): A simple method to identify important spectral features of EEG in deep learning models**
David Nahmias: FDA UMD; Kimberly Kontson: U.S. FDA

366 **OptMatch: Optimized Matchmaking via Modeling the High-Order Interactions on the Arena**
Linxia Gong: Netease; Xiaochuan Feng: Netease; Dezhi Ye: Netease; Hao Li: Netease; Runze Wu: Netease; Jianrong Tao: Netease; Changjie Fan: Netease; Peng Cui: Tsinghua University

2151 **Game Action Modeling for Fine Grained Analyses of Player Behavior in Multi-player Card Games (Rummy as case study)**
Sharanya Eswaran: Games x ; Mridul Sachdeva: Games x ; Vikram Vimal: Games x ; Deepanshi Seth: Games x ; Suhaas Kalpam: Games x ; Sanjay Agrawal: Games x ; Tridib Mukherjee: games x ; Samrat Dattagupta: Games x

Responsible Data Science/Social Impact

1710 **Cracking Tabular Presentation Diversity for Automatic Cross-Checking over Numerical Facts**
Hongwei Li: Institute of Computing Technology CAS University of Chinese Acadamy of Sciences ; Qingping Yang: Institute of Computing Technology CAS University of Chinese Acadamy of Sciences ; Yixuan Cao: Institute of Computing Technology CAS University of Chinese Acadamy of Sciences ; Jiaquan Yao: School of Management Jinan University ; Ping Luo: Institute of Computing Technology CAS University of Chinese Acadamy of Sciences

2267 **Cascade-LSTM: A Tree-Structured Neural Classifier for Detecting Misinformation Cascades**
Zenan Wang: UC Berkeley; Xuan Yin: Etsy Inc.; Tianbo Li: Etsy Inc.; Liangjie Hong: Etsy Inc.

329 **Sub-Matrix Factorization for Real-Time Vote Prediction**
Alexander Immer: Ecole Polytechnique F d rale de Lausanne; Victor Kristof: Ecole Polytechnique F d rale de Lausanne; Matthias Grossglauser: Ecole Polytechnique F d rale de Lausanne; Patrick Thiran: Ecole Polytechnique F d rale de Lausanne

82 **TIMME: Twitter Ideology-detection via Multi-task Multi-relational Embedding**
Zhiping Xiao: Computer Science Department University of California at Los Angeles ; Weiping Song: Department of Computer Science School of EECS Peking University. ; Haoyan Xu: College of Control Science and Engineering Zhejiang University ; Zhicheng Ren: Computer Science Department University of California at Los Angeles ; Yizhou Sun: Computer Science Department University of California at Los Angeles

658 **Context-Aware Attentive Knowledge Tracing**
Aritra Ghosh: University of Massachussets Amherst ; Neil Heffernan: Worcester Polytechnic Institute; Andrew Lan: University of Massachusetts Amherst

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Hu Liu: JD.com; Jing Lu: JD.com; Hao Yang: JD.com; Xiwei Zhao: JD.com; Sulong Xu: JD.com; Hao Peng: JD.com; Zehua Zhang: JD.com; Wenjie Niu: JD.com; Xiaokun Zhu: JD.com; Yongjun Bao: JD.com; Weipeng Yan: JD.com

351 **Geodemographic Influence Maximization**

Kaichen Zhang: BUPT Baidu; Jingbo Zhou: Baidu; Donglai Tao: Tsinghua U; Panagiotis Karras: Aarhus University; Qing Li: Baidu; Hui Xiong: Baidu

1135 **A Request-level Guaranteed Delivery Advertising Planning: Forecasting and Allocation**

Hong Zhang: Tencent; Lan Zhang: University of Science of Technology of China; Lan Xu: Tencent; Xiaoyang Ma: Tencent; Zhengtao Wu: University of Science of Technology of China; Cong Tang: University of Science of Technology of China; Wei Xu: Tencent; Yiguo Yang: Tencent

1978 **Jointly Learning to Recommend and Advertise**

Xiangyu Zhao: Michigan State University; Xudong Zheng: Bytedance; Xiwang Yang: Bytedance; Xiaobing Liu: Bytedance; Jiliang Tang: Michigan State University

2162 **Ads Allocation in Feed via Constrained Optimization**

Jinyun Yan: LinkedIn; Zhiyuan Xu: LinkedIn; Birjodh Tiwana: LinkedIn; Shaunak Chatterjee: LinkedIn

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1740 **Dynamic Heterogeneous Graph Neural Network for Real-time Event Prediction**

Wenjuan Luo: DiDi Chuxing; Han Zhang: DiDi Chuxing; Xiaodi Yang: DiDi Chuxing; Lin Bo: DiDi Chuxing; Xiaoqing Yang: DiDi Chuxing; Zang Li: DiDi Chuxing; Xiaohu Qie: DiDi Chuxing; Jieping Ye: DiDi Chuxing

1624 **Time-Aware User Embeddings as a Service**

Martin Pavlovski: Temple University; Jelena Gligorijevic: Yahoo Research; Ivan Stojkovic: Yahoo Research; Shubham Agrawal: Yahoo Research; Shabhareesh Komirishetty: Yahoo Reserach; Djordje Gligorijevic: Yahoo Research; Narayan Bhamidipati: Yahoo Research; Zoran Obradovic: Temple University

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1446 **Price Investment using Prescriptive Analytics and Optimization in Retail**

Linsey Pang: Walmart Labs; Avinash Thangali: Walmart Labs; Karthick Gopalswamy: Walmart Labs; Ketki Gupta: Walmart Labs; Dnyanesh Kulkarni: Walmart Labs; Sunil Potnuru: Walmart Labs; Supreeth Shastry: Walmart Labs; Harshada Vuyyuri: Walmart Labs; Timothy Winters: Walmart Labs; Prakhar Mehrotra: Walmart Labs

676 **Large-Scale Training System for 100-Million Classification at Alibaba**

Liuyihan Song: Alibaba Group; Pan Pan: Alibaba Group; Kang Zhao: Alibaba Group; Hao Yang: Alibaba Group; Yiming Chen: Alibaba Group; Yingya Zhang: Alibaba Group; Yinghui Xu: Alibaba Group; Rong Jin: Alibaba Group

1925 **Bootstrapping Complete The Look at Pinterest**

Eileen Li: Pinterest; Eric Kim: Pinterest; Andrew Zhai: Pinterest; Josh Beal: Pinterest; Kunlong Gu: Pinterest

1354 **Attention based multi-modal new product sales time-series forecasting**

Vijay Ekambaram: IBM Research; Kushagra Manglik: IBM Research; Sumanta Mukherjee: IBM Research; Surya Shravan Kumar Sajja: IBM Research; Satyam Dwivedi: IBM Research; Vikas Raykar: IBM Research

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1672 **Shop The Look: Building a Large Scale Visual Shopping System at Pinterest**

Raymond Shiau: Pinterest; Hao-Yu Wu: Pinterest; Eric Kim: Pinterest; Yue Li Du: Pinterest; Anqi Guo: Pinterest; Zhiyuan Zhang: Pinterest; Eileen Li: Pinterest; Kunlong Gu: Pinterest; Charles Rosenberg: Pinterest; Andrew Zhai: Pinterest

2218 **A Dual Heterogeneous Graph Attention Network to Improve Long-Tail Performance for Shop Search in E-Commerce**

Xichuan Niu: Wuhan University; Bofang Li: Alibaba Group; Chenliang Li: Wuhan University; Rong Xiao: Alibaba Group; Haochuan Sun: Alibaba Group; Hongbo Deng: Alibaba Group; Zhenzhong Chen: Wuhan University

541 **Debiasing Grid-based Product Search in E-commerce**

Ruocheng Guo: Arizona State University; Xiaoting Zhao: Etsy; Adam Henderson: Etsy Inc.; Liangjie Hong: Etsy Inc.; Huan Liu: Arizona State University

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1191 **Learning to Generate Personalized Query Auto-Completions via a Multi-View Multi-Task Attentive Approach**

Di Yin: National Key Laboratory for Novel Software Technology Nanjing University ; Jiwei Tan: Alibaba Group; Zhe Zhang: Alibaba Group; Hongbo Deng: Alibaba Group; Shujian Huang: National Key Laboratory for Novel Software Technology Nanjing University ; Jiajun Chen: National Key Laboratory for Novel Software Technology Nanjing University

213 **AutoKnow: Self-Driving Knowledge Collection for Products of Thousands of Types**

Gabriel Blanco Saldana: Amazon; Saurabh Deshpande: Amazon; Xin Luna Dong: Amazon; Xiang He: Amazon; Andrey Kan: Amazon; Xian Li: Amazon; Yan Liang: Amazon; Jun Ma: Amazon; Alexandre Michetti Manduca: Amazon; Jay Ren: Amazon; Surender Pal Singh: Amazon; Fan Xiao: Amazon; Yifan Ethan Xu: Amazon; Chenwei Zhang: Amazon; Tong Zhao: Amazon; Haw-Shiuan Chang: University of Massachusetts Amherst; Giannis Karamanolakis: Columbia University; Yuning Mao: University of Illinois at Urbana Champaign; Yaqing Wang: State University of New York at Buffalo; Christos Faloutsos: Carnegie Mellon University; Andrew McCallum: University of Massachusetts Amherst; Jiawei Han: University of Illinois at Urbana Champaign

Room 2: Content Recommendation & Retrieval

1508 **Taming Pretrained Transformers for eXtreme Multi-label Text Classification**

Wei-Cheng Chang: Carnegie Mellon University; Hsiang-Fu Yu: Amazon; Kai Zhong: Amazon; Yiming Yang: Carnegie Mellon University; Inderjit Dhillon: Amazon and UT Austin

2257 **Learning with Limited Labels via Momentum Damped Differentially Weighted Training**

Rishabh Mehrotra: Spotify Research; Ashish Gupta: Walmart Labs

639 **User Sentiment as a Success Metric: Persistent Biases Under Full Randomization**

Ercan Yildiz: Google; Joshua Safyan: Google; Marc Harper: Google

1518 **Prediction of Hourly Earnings and Completion Time on a Crowdsourcing Platform**

Anna Lioznova: Yandex; Alexey Drutsa: Yandex; Vladimir Kukushkin: Vkontakte; Anastasia Bezzubtseva: Yandex

374 **Domain Specific Knowledge Graphs as a Service to the Public**

Ying Li: Giving Tech Labs; Vitalii Zakhozhyi: Giving Tech Labs; Daniel Zhu: Giving Tech Labs; Luis Salazar: Giving Tech Labs

556 **Salience and Market-aware Skill Extraction for Job Targeting**

Baoxu Shi: LinkedIn; Jaewon Yang: LinkedIn; Feng Guo: LinkedIn; Qi He: LinkedIn

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1319 **Meta-Learning for Query Conceptualization at Web Scale**

Fred X. Han: University of Alberta; Di Niu: University of Alberta; Haolan Chen: Tencent; Weidong Guo: Tencent; Shengli Yan: Tencent; Bowei Long: Tencent

228 **Personalized Image Retrieval with Sparse Graph Representation Learning**

Xiaowei Jia: University of Minnesota; Handong Zhao: Adobe Research; Zhe Lin: Adobe Research; Ajinkya Kale: Adobe Inc; Vipin Kumar: University of Minnesota

359 **Maximizing Cumulative User Engagement in Sequential Recommendation: An Online Optimization Perspective**

Yifei Zhao: Alibaba; Yu-Hang Zhou: Alibaba; Mingdong Ou: Alibaba

661 **Improving Recommendation Quality in Google Drive**

Suming J. Chen: Google; Zhen Qin: Google; Zachary Wilson: Google; Brian Calaci: Google; Michael Rose: Google; Ryan Evans: Google; Sean Abraham: Google; Donald Metzler: Google; Sandeep Tata: Google; Mike Colagrosso: Google

817 **Controllable Multi-Interest Framework for Recommendation**

Yukuo Cen: Tsinghua University; Jianwei Zhang: Alibaba Group; Xu Zou: Tsinghua University; Chang Zhou: Alibaba Group; Hongxia Yang: Alibaba Group; Jie Tang: Tsinghua University

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1334 **Multitask Mixture of Sequential Experts for User Activity Streams**

Yicheng Cheng: Google; Zhen Qin: Google Inc.; Zhe Zhao: Google; Zhe Chen: Google; Donald Metzler: Google; Jingzheng Qin: Google

1605 **SimClusters: Community-Based Representations for Heterogeneous Recommendations at Twitter**

Venu Satuluri: Twitter; Yao Wu: Twitter; Xun Zheng: Carnegie Mellon University; Yilei Qian: Twitter; Brian Wichers: Twitter; Qieyun Dai: Twitter; Gui Ming Tang: Twitter; Jerry Jiang: Twitter; Jimmy Lin: University of Waterloo

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1745 **Joint Optimization of Multiple Objectives on Music Streaming Platforms**
Rishabh Mehrotra: Spotify Research; Mounia Lalmas: Spotify; Niannan Xue: ICL

2116 **Gemini: A novel and universal heterogeneous graph information fusing framework for online recommendations**
Jixing Xu: DiDiChuxing; Zhenlong Zhu: DiDiChuxing; Jianxin Zhao: DiDiChuxing; Xuanye Liu: DiDiChuxing; Minghui Shan: DiDiChuxing; Jiecheng Guo: DiDiChuxing

1872 **DeepTriage: Automated Transfer Assistance for Incidents in Cloud Services**
Phuong Pham: Microsoft; Vivek Jain: Microsoft; Lukas Dauterman: Microsoft; Justin Ormont: Microsoft; Navendu Jain: Microsoft

34 **Personalized Prefix Embedding for POI Auto-Completion in the Search Engine of Baidu Maps**
Jizhou Huang: Baidu; Haifeng Wang: Baidu; Miao Fan: Baidu; An Zhuo: Baidu Inc.; Ying Li: Baidu Inc.

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477 **Improving Deep Learning For Airbnb Search**
Malay Haldar: Airbnb; Mustafa Abdool: Airbnb; Prashant Ramanathan: Airbnb Inc ; Tyler Sax: Airbnb Inc. ; Lanbo Zhang: Airbnb Inc. ; Aamir Manasawala: Airbnb Inc ; Shulin Yang: Airbnb Inc. ; Bradley Turnbull: Airbnb; Junshuo Liao: Airbnb Inc.

736 **Mining Implicit Relevance Feedback from User Behavior for Web Question Answering**
Linjun Shou: STCA NLP Group Microsoft Beijing ; Shining Bo: School of Information and Communication Engineering BUPT ; Feixiang Cheng: STCA NLP Group Microsoft Beijing ; Ming Gong: STCA NLP Group Microsoft Beijing ; Jian Pei: School of Computing Science Simon Fraser University ; Daxin Jiang: STCA NLP Group Microsoft Beijing

1096 **Managing Diversity in Airbnb Search**
Mustafa Abdool: Airbnb; Malay Haldar: Airbnb; Prashant Ramanathan: Airbnb; Tyler Sax: Airbnb; Lanbo Zhang: Airbnb; Aamir Manasawala: Airbnb; Shulin Yang: Airbnb; Bradley Turnbull: Airbnb; Qing Zhang: Airbnb; Thomas Legrand: Airbnb

2139 **Towards Building an Intelligent Chatbot for Customer Service: Learning to Respond at the Appropriate Time**
Che Liu: AILabs DiDi chuxing ; Junfeng Jiang: AILabs DiDi chuxing ; Chao Xiong: AILabs DiDi chuxing ; Yi Yang: AILabs DiDi chuxing ; Jieping Ye: AILabs DiDi chuxing

1399 **TIES: Temporal Interaction Embeddings For Enhancing Social Media Integrity At Facebook**
Nima Noorshams: FACEBOOK; Saurabh Verma: FACEBOOK; Aude Hofleitner: FACEBOOK

Room 2: Earth Science

1392 **Pest management in cotton farms: an AI-system case study from the global South**
Aman Dalmia: Wadhwani Institute for Artificial Intelligence; Jerome White: Wadhwani Institute for Artificial Intelligence; Ankit Chaurasia: Wadhwani Institute for Artificial Intelligence; Vishal Agarwal: Wadhwani Institute for Artificial Intelligence; Rajesh Jain: Wadhwani Institute for Artificial Intelligence; Dhruvin Vora: Wadhwani Institute for Artificial Intelligence; Balasaheb Dhame: Wadhwani Institute for Artificial Intelligence; Raghu Dharmaraju: Wadhwani Institute for Artificial Intelligence; Rahul Panicker: Wadhwani Institute for Artificial Intelligence

1987 **Fitbit for Chickens? Time Series Data Mining Can Increase the Productivity of Poultry Farms**
Alireza Abdoli: University of California Riverside; Sara Alaee: University of California Riverside; Shima Imani: University of California Riverside; Amy Murillo: University of California Riverside ; Alec Gerry: UC Riverside; Leslie Hickle: FarmSense Inc; Eamonn Keogh: UC Riverside

1456 **Climate Downscaling Using YNet: a Deep Convolutional Network with Skip Connections and Fusion**
Yumin Liu: Northeastern University; Auroop Ganguly: Northeastern University; Jennifer Dy: Northeastern University

1844 **CrowdQuake: A Networked System of Low-Cost Sensors for Earthquake Detection via Deep Learning**
Xin Huang: Florida Institute of Technology; Jangsoo Lee: Kyungpook National University; Young-Woo Kwon: Kyungpook National University; Chul-Ho Lee: Florida Institute of Technology

555 **Forecasting the Evolution of Hydropower Generation**
Fan Zhou: School of Information and Software Engineering University of Electronic Science and Technology of China ; Liang Li: School of Information and Software Engineering University of Electronic Science and Technology of China ; Kunpeng Zhang: University of Maryland; Goce Trajcevski: Iowa State University; Fuming Yao: China Energy Investment Co.; Ying Huang: China Energy Investment Co.; Ting Zhong: University of Electronic Science and Technology of China; Jiahao Wang: School of Information and Software Engineering University of Electronic Science and Technology of China ; Qiao Liu: School of Information and Software Engineering University of Electronic Science and Technology of China

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1112 Learning to score economic development from satellite imagery

Sungwon Han: Korea Advanced Institute of Science and Technology; Donghyun Ahn: Korea Advanced Institute of Science and Technology; Sungwon Park: Korea Advanced Institute of Science and Technology; Jeasurk Yang: National University of Singapore; Susang Lee: Korea Advanced Institute of Science and Technology; Jihee Kim: Korea Advanced Institute of Science and Technology; Hyunjoo Yang: Sogang University; Sangyoon Park: University of Hong Kong; Meeyoung Cha: Institute for Basic Science Korea Advanced Institute of Science and Technology

Session 5 - Tue 7-8 PM I Wed 7-8 AM

Room 1: GIS

538 Unsupervised Translation via Hierarchical Anchoring: Functional Mapping of Places across Cities

Takahiro Yabe: Purdue University; Kota Tsubouchi: Yahoo Japan Research; Toru Shimizu: Yahoo Japan; Yoshihide Sekimoto: The University of Tokyo; Satish Ukkusuri: Purdue University

1824 Multi Modal Deep Learning Based Crop Classification Using Multispectral and Multitemporal Satellite Imagery

Krishna Karthik Gadiraju: North Carolina State University; Bharathkumar Ramachandra: North Carolina State University; Zexi Chen: North Carolina State University; Ranga Raju Vatsavai: North Carolina State University

1349 Identifying Homeless Youth At-Risk of Substance Use Disorder: Data-Driven Insights for Policymakers

Maryam Tabar: Pennsylvania State University; Heesoo Park: Sungkyunkwan University; Stephanie Winkler: Pennsylvania State University; Dongwon Lee: Pennsylvania State University; Anamika Barman-Adhikari: University of Denver; Amulya Yadav: Pennsylvania State University

1912 An Automatic Approach for Generating Rich, Linked Geo-Metadata from Historical Map Images

Zekun Li: University of Southern California; Yao-Yi Chiang: University of Southern California; Sasan Tavakkol: Google Research; Basel Shbita: University of Southern California; Johannes H. Uhl: University of Colorado Boulder; Stefan Leyk: University of Colorado Boulder; Craig A. Knoblock: University of Southern California

Room 1: Mobile Applications & Usage

530 General-Purpose User Embeddings based on Mobile App Usage

Junqi Zhang: Tencent; Bing Bai: Tencent; Ye Lin: Tencent; Jian Liang: Tencent; Kun Bai: Tencent; Fei Wang: Cornell University

Room 2: Mobile Applications & Usage

1255 A Sleeping, Recovering Bandit Algorithm for Optimizing Recurring Notifications

Kevin Yancey: Duolingo; Burr Settles: Duolingo

1830 Characterizing and Learning Representation on Customer Contact Journeys in Cellular Services

Shuai Zhao: New Jersey Institute of Technology; Wen-Ling Hsu: AT T Labs Research; George Ma: AT T Labs Research; Tan Xu: AT T Labs Research; Guy Jacobson: AT T Labs Research; Raif Rustamov: AT T Labs Research

2036 Intelligent Exploration for User Interface Modules of Mobile App with Collective Learning

Jingbo Zhou: Business Intelligence Lab Baidu Research ; Zhenwei Tang: Business Intelligence Lab Baidu Research ; Min Zhao: Baidu User Experience Department; Xiang Ge: Baidu User Experience Department; Fuzheng Zhuang: Institute of Computing Technology Chinese Academy of Sciences ; Meng Zhou: Business Intelligence Lab Baidu Research ; Liming Zou: Baidu User Experience Department; Chenglei Yang: Shandong University; Hui Xiong: Business Intelligence Lab Baidu Research

Room 2: Other Applications

1103 Molecular Inverse-Design Platform for Material Industries

Seiji Takeda: IBM Research Tokyo; Toshiyuki Hama: IBM Research Tokyo; Hsiang-Han Hsu: IBM Research Tokyo; Victoria Piunova: IBM Almaden Research Center; Dmitry Zubarev: IBM Almaden Research Center; Daniel Sanders: IBM Almaden Research Center; Jed Pitera: IBM Almaden Research Center; Makoto Kogoh: IBM Garage Tokyo Laboratory ; Takumi Hongo: IBM Garage Tokyo Laboratory ; Yenwei Cheng: IBM Garage Tokyo Laboratory ; Wolf Bocanett: IBM Garage Tokyo Laboratory ; Hideaki Nakashika: IBM Garage Tokyo Laboratory ; Akihiro Fujita: HAYASHIBARA Co. Ltd. ; Yuta Tsuchiya: HAYASHIBARA Co. Ltd. ; Katsuhiko Hino: HAYASHIBARA Co. Ltd. ; Kentaro Yano: HAYASHIBARA Co. Ltd. ; Shuichi Hirose: NAGASE Co. Ltd. ; Hiroki Toda: NAGASE Co. Ltd. ; Yasumitsu Orii: NAGASE Co. Ltd. ; Daiju Nakano: IBM Research Tokyo

1971 Explainable classification of brain networks via contrast subgraphs

Tommaso Lanciano: La Sapienza University of Rome; Francesco Bonchi: Fondazione ISI; Aristides Gionis: KTH Royal Institute of Technology

1507 Cracking the Black Box: Distilling Deep Sports Analytics

Xiangyu Sun: Simon Fraser University; Jack Davis: Simon Fraser University; Oliver Schulte: Simon Fraser University; Guiliang Liu: Simon Fraser University

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Session 6 - Wed 5-6 PM | Thu 5-6 AM

Room 1: Fraud Detection & Security

137 **Faster Secure Data Mining via Distributed Homomorphic Encryption**
Junyi Li: University of Pittsburgh; Heng Huang: JD Finance America Corporation and University of Pittsburgh

200 **Contagious Chain Risk Rating for Networked-guarantee Loans**
Dawei Cheng: Shanghai Jiao Tong University; Zhibin Niu: Tianjin University; Yiyi Zhang: Shanghai Jiao Tong University

588 **DATE: Dual Attentive Tree-aware Embedding for Customs Fraud Detection**
Sundong Kim: Institute for Basic Science; Yu-Che Tsai: National Cheng Kung University; Karandeep Singh: Institute for Basic Science; Yeonsoo Choi: World Customs Organization; Etim Ibok: Nigeria Customs Service; Cheng-Te Li: National Cheng Kung University; Meeyoung Cha: Institute for Basic Science

1189 **Two Sides of the Same Coin: White-box and Black-box Attacks for Transfer Learning**
Yinghua Zhang: The Hong Kong University of Science and Technology; Yangqiu Song: Hong Kong University of Science and Technology; Jian Liang: Cloud and Smart Industries Group Tencent ; Kun Bai: Cloud and Smart Industries Group Tencent ; Qiang Yang: Hong Kong University of Science and Technology

1279 **Fraud Transactions Detection via Behavior Tree with Local Intention Calibration**
Can Liu: Alibaba Group; Qiwei Zhong: Alibaba Group; Xiang Ao: Institute of Computing Technology Chinese Academy of Sciences ; Li Sun: Alibaba Group; Wangli Lin: Alibaba Group; Jinghua Feng: Alibaba Group; Qing He: Institute of Computing Technology Chinese Academy of Sciences ; Jiayu Tang: Alibaba Group

Room 2: Fraud Detection & Security

357 **A Self-Evolving Mutually-Operative Recurrent Network-based Model for Online Tool Condition Monitoring in Delay Scenario**
Monidipa Das: Nayang Technological University NTU Singapore ; Mahardhika Pratama: Nanyang Technological University NTU ; Tegoeh Tjahjowidodo: KU Leuven

1353 **Interleaved Sequence RNNs for Fraud Detection**
Bernardo Branco: Feedzai; Pedro Abreu: QuantumBlack a McKinsey company ; Ana Sofia Gomes: Feedzai; Mariana Almeida: Cleverly; João Tiago Ascensão: Feedzai; Pedro Bizarro: Feedzai

2168 **USAD : UnSupervised Anomaly Detection on multivariate time series**
Julien Audibert: Orange EURECOM; Pietro Michiardi: EURECOM; Frédéric Guyard: Orange Labs; Sébastien Marti: Orange; Maria A. Zuluaga: EURECOM

1864 **An Empirical Analysis of Backward Compatibility in Machine Learning Systems**
Megha Srivastava: Stanford University; Besmira Nushi: Microsoft Research; Ece Kamar: Microsoft Research; Shital Shah: Microsoft Research; Eric Horvitz: Microsoft Research

Room 2: Multimedia Mining

1256 **Multi-objective Optimization for Guaranteed Delivery in Video Service Platform**
Hang Lei: Alibaba Group; Yin Zhao: Alibaba Group; Longjun Cai: Alibaba Group

268 **Comprehensive Information Integration Modeling Framework for Video Titling**
Shengyu Zhang: Zhejiang University; Ziqi Tan: Zhejiang University; Jin Yu: Alibaba Group; Zhou Zhao: Zhejiang University; Kun Kuang: Zhejiang University; Tan Jiang: Zhejiang University; Hongxia Yang: Alibaba Group; Fei Wu: Zhejiang University; Jingren Zhou: Alibaba Group

Session 7 - Wed 6-7 PM | Thu 6-7 AM

Room 1: Multimedia Mining

339 **Acoustic Measures for Real-Time Voice Coaching**
Ying Li: Giving Tech Labs; Abraham Miller: Giving Tech Labs; Arthur Liu: Giving Tech Labs; Kyle Coburn: Giving Tech Labs; Luis Salazar: Giving Tech Labs

456 **LRSpeech: Extremely Low-Resource Speech Synthesis and Recognition**
Jin Xu: Tsinghua University; Xu Tan: Microsoft Research Asia; Yi Ren: Zhejiang University; Tao Qin: Microsoft Research Asia; Jian Li: Tsinghua University; Sheng Zhao: Microsoft STC Asia; Tie-Yan Liu: Microsoft Research Asia

2136 **Hypergraph Convolutional Recurrent Neural Network**
Jaehyuk Yi: KAIST; Jinkyoo Park: KAIST

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Room 1: Transportation & Logistics

1302 Balanced Order Batching with Task-Oriented Graph Clustering

Lu Duan: Zhejiang Cainiao Supply Chain Management Co. Ltd ; Zili Wu: Zhejiang Cainiao Supply Chain Management Co. Ltd ; Guozheng Li: Zhejiang Cainiao Supply Chain Management Co. Ltd ; Yu Gong: Alibaba Group; Xinhang Zhang: Zhejiang Cainiao Supply Chain Management Co. Ltd ; Haoyuan Hu: Zhejiang Cainiao Supply Chain Management Co. Ltd ; Yinghui Xu: Zhejiang Cainiao Supply Chain Management Co. Ltd

1262 Delivery Scope: A New Way of Restaurant Retrieval For On-demand Food Delivery Service

Xuetao Ding: Meituan Dianping Group; Runfeng Zhang: Meituan Dianping Group; Zhen Mao: Meituan Dianping Group; Ke Xing: Meituan Dianping Group; Fangxiao Du: Meituan Dianping Group; Xingyu Liu: Meituan Dianping Group; Guoxing Wei: Meituan Dianping Group; Feifan Yin: Meituan Dianping Group; Renqing He: Meituan Dianping Group; Zhizhao Sun: Meituan Dianping Group

Room 2: Transportation & Logistics

470 Doing in One Go: Delivered Time Inference Based on Coueriers' Trajectories

Sijie Ruan: Xidian University; Zi Xiong: Wuhan University; Cheng Long: Nanyang Technological University; Yiheng Chen: JD Logistics; Jie Bao: JD Intelligent Cities Research; Tianfu He: Harbin Institute of Technology; Ruiyuan Li: Xidian University; Shengnan Wu: JD Logistics; Zhongyuan Jiang: Xidian University; Yu Zheng: Xidian University

113 ConSTGAT: Contextual Spatial-Temporal Graph Attention Network for Travel Time Estimation at Baidu Maps

Fang Xiaomin: Baidu Inc.; Jizhou Huang: Baidu Inc.; Fan Wang: Baidu Inc.; Lingke Zeng: Baidu Inc.; Haijin Liang: Baidu Inc.; Haifeng Wang: Baidu Inc.

1307 Efficiently Solving the Practical Vehicle Routing Problem: A Novel Joint Learning Approach

Lu Duan: Zhejiang Cainiao Supply Chain Management Co. Ltd ; Yang Zhan: Zhejiang Cainiao Supply Chain Management Co. Ltd ; Jiangwen Wei: Zhejiang Cainiao Supply Chain Management Co. Ltd ; Yu Gong: Alibaba Group; Haoyuan Hu: Zhejiang Cainiao Supply Chain Management Co. Ltd ; Yinghui Xu: Zhejiang Cainiao Supply Chain Management Co. Ltd

1325 Hybrid Spatio-Temporal Graph Convolutional Network: Improving Traffic Prediction with Navigation Data

Rui Dai: Autonavi Alibaba Group ; Shenkun Xu: Autonavi Alibaba Group ; Qian Gu: Autonavi Alibaba Group ; Chenguang Ji: Autonavi Alibaba Group ; Kaikui Liu: Autonavi Alibaba Group

1825 BusTr: predicting bus travel times from real-time traffic

Richard Barnes: UC Berkeley; Senaka Buthpitiya: Google Research; James Cook: N ne; Alex Fabrikant: Google Research; Andrew Tomkins: Google Research; Fangzhou Xu: Google Research

1994 CompactETA: A Fast Inference System for Travel Time Prediction

Kun Fu: AI Labs DiDi Chuxing ; Fanlin Meng: AI Labs DiDi Chuxing ; Jieping Ye: AI Labs DiDi Chuxing ; Zheng Wang: AI Labs DiDi Chuxing