MLRec 2017
3rd International Workshop on Machine Learning Methods for Recommender Systems
In conjunction with 17th SIAM International Conference on Data Mining (SDM 2017) April 27 - 29, 2017, Houston, Texas, USA

Following the success of the last editions of MLRec in 2015 and 2016, the third edition of the MLRec workshop focuses on developing novel, and applying existing Machine Learning (ML) and Data Mining (DM) methods to improve recommender systems. This workshop also highly encourages applying ML-based recommendation algorithms in novel application domains (e.g., precision medicine), and solving novel recommendation problems formulated from industry. The ultimate goal of the MLRec workshop series is to promote the advancement and implementation of new, effective and efficient ML and DM techniques with high translational potential for real and large-scale recommender systems, and to expand the territory of ML-based recommender system research toward non-conventional application areas where recommendation problems largely exist but haven't been fully recognized.

In this workshop, there will be 5 invited talks and 6 paper presentations.

Topics of Interest

The workshop will cover topics including:

- Novel machine learning algorithms for recommender systems, e.g., new content-based or context-aware recommendation algorithms, new algorithms for matrix factorization, tensor-based approaches for recommender systems, etc.
- Novel applications of existing machine learning and data mining algorithms for recommender systems, e.g., applying bilinear models, (non-convex) sparse learning, metric learning, low-rank approximation/PCA/SVD, neural networks and deep learning, etc.
- Novel optimization techniques for improving recommender systems, e.g., parallel/distributed optimization techniques, efficient stochastic gradient descent, etc.
- Industrial practices and implementations of recommendation systems, e.g., feature engineering, model ensemble, large-scale implementations of recommender systems, etc.
- Emerging recommendation problems and scenarios in industry and their ML-based solutions, e.g., recommendation for e-fashion, etc.
- Novel recommendation problems in non-conventional recommender system research areas (e.g., precision medicine, health informatics) and their ML-based solutions, e.g., recommendation of physicians, recommendation of healthy life-styles for seniors, etc.

Invited Speakers

David F. Gleich, Purdue
Title: Use of Social Networks in Recommendation Systems
Abstract: Consider the problem of incorporating social network information into a recommendation system. Intuitively solving this problem should improve the recommender's performance. In this talk, I will discuss the challenges, present the current state-of-the-art, and outline some promising directions for this problem.
Bio: David Gleich is an assistant professor in the Computer Science Department at

Purdue University whose research is on novel models and fast large-scale algorithms for data-driven scientific computing including scientific data analysis and social network analysis. He held the John von Neumann post-doctoral fellowship at Sandia National Laboratories in Livermore CA before joining Purdue in Fall 2011. Gleich received an NSF CAREER Award in 2011 for work on matrix methods for large-scale network analysis. His research is funded by the NSF, DOE, DARPA, and NASA. In 2016, Gleich also received a Sloan Research Fellowship. For more information, see his website: https://www.cs.purdue.edu/homes/dgleich/

Suju Rajan, Criteo Research
Title: Use of Social Networks in Recommendation Systems
Abstract: Consider the problem of incorporating social network information into a recommendation system. Intuitively solving this problem should improve the recommender's performance. In this talk, I will discuss the challenges, present the current state-of-the-art, and outline some promising directions for this problem.
Bio: Suju Rajan is the VP, Head of Research at Criteo. At Criteo, her team works on all aspects of performance driven computational advertising, including, real-time bidding, large-scale recommendation systems, auction theory, reinforcement learning, online experimentation, metrics and scalable optimization methods. Prior to Criteo, she was the Director of the Personalization Sciences at Yahoo Research where her team worked on personalized recommendations for several Yahoo products. She received her PhD from the University of Texas at Austin, focusing on semi-supervised and active learning based classification for dynamic environments.

Adith Swaminathan, Microsoft Research
Title: Use of Social Networks in Recommendation Systems
Abstract: Consider the problem of incorporating social network information into a recommendation system. Intuitively solving this problem should improve the recommender's performance. In this talk, I will discuss the challenges, present the current state-of-the-art, and outline some promising directions for this problem.
Bio: Dr. Swaminathan is currently a researcher in the Deep Learning Technology Center at Microsoft Research. His research is on Machine Learning and Artificial Intelligence, with applications that grapple with ambiguity (e.g. Natural Language Processing) and/or adapt to an ever-changing worldview. He was advised by Prof. Thorsten Joachims during his PhD at Cornell University in the Department of Computer Science, with Prof. Johannes Gehrke, Prof. Éva Tardos and Prof. Robert Kleinberg in his committee. His thesis studies machine learning for interactive systems. He developed principles and algorithms that can re-use the interaction logs of these systems to inform the design of (train and evaluate) future systems.

Jun Wang, Alibaba
Title: Use of Social Networks in Recommendation Systems
Abstract Consider the problem of incorporating social network information into a recommendation system. Intuitively solving this problem should improve the recommender's performance. In this talk, I will discuss the challenges, present the current state-of-the-art, and outline some promising directions for this problem.
Bio: Dr. Jun Wang is a Director of Engineering at Alibaba Group where he is responsible for leading the development of an intelligent data platform for IOT, and empowering Alibaba's mobile OS (YunOS) with the company's robust data management and analytics capabilities. In 2016, his team won the international championship in the prestigious challenge of recommendation system design (RecSys). He is also an adjunct

faculty at Columbia University and has taught graduate courses in large scale data analytics. Before joining Alibaba, he worked for IBM T. J. Watson Research and Google. Wang holds a Ph.D. degree from Columbia University in the City of New York.

Yisong Yue, California Institute of Technology
Title: The Dueling Bandits Problem
Abstract: In this talk, I will present the Dueling Bandits Problem, which is an online learning framework tailored towards real-time learning from subjective human feedback. In particular, the Dueling Bandits Problem only requires pairwise comparisons, which are shown to be reliably inferred in a variety of subjective feedback settings such as for information retrieval and recommender systems. I will provide an overview of the Dueling Bandits Problem with basic algorithmic results. I will then conclude by discussing some ongoing research directions with applications to personalized medicine. This is joint work with Josef Broder, Bobby Kleinberg, Thorsten Joachims, Yanan Sui, Vincent Zhuang, and Joel Burdick.
Bio: Yisong Yue is an assistant professor in the Computing and Mathematical Sciences Department at the California Institute of Technology. He was previously a research scientist at Disney Research. Before that, he was a postdoctoral researcher in the Machine Learning Department and the iLab at Carnegie Mellon University. He received a Ph.D. from Cornell University and a B.S. from the University of Illinois at Urbana-Champaign. Yisong's research interests lie primarily in the theory and application of statistical machine learning. He is particularly interested in developing novel methods for spatiotemporal reasoning, structured prediction, interactive learning systems, and learning with humans in the loop. In the past, his research has been applied to information retrieval, recommender systems, text classification, learning from rich user interfaces, analyzing implicit human feedback, data-driven animation, behavior analysis, sports analytics, policy learning in robotics, and adaptive routing & allocation problems.

Organizers

Organizing Committee

Xia Ning is currently an Assistant Professor at the Department of Computer and Information Science, Indiana University – Purdue University Indianapolis (IUPUI). Before joining IUPUI, she was a research staff member at NEC Labs America. Xia received her PhD. degree in Computer Science at University of Minnesota, Twin Cities in 2012. Her research focuses on Recommender Systems, Chemical Informatics and Health Informatics. The results from her research have been presented in various conferences and published in leading peer reviewed journals and highly selective conference proceedings. She has been serving as a program committee member on various premier data mining conferences such as KDD, ICDM and SDM, and Recsys.

Deguang Kong is currently a Senior Research Scientist (principal engineer) at Yahoo Research. He worked previously at Samsung Research America, Los Alamos National Lab, NEC research lab, and Penn State University as a researcher. His research interests revolve around machine learning and data science. He has published over 30 referred papers in top conferences, including ICML, NIPS, AAAI, CVPR, KDD, ICDM, SDM, WSDM, CIKM, etc. He has served in program committees of KDD, SDM, AAAI, IJCAI, and reviewed for TDSC, TIFS, TPAMI, TKDE and NIPS. He got two best paper awards: Securecomm 2010 and Samsung best paper 2015.

George Karypis is currently Professor at the Department of Computer Science &

Engineering at the University of Minnesota in the Twin Cities of Minneapolis and Saint Paul and a member of the Digital Technology Center (DTC) at the University of Minnesota. His research interests are concentrated in the areas of bioinformatics, cheminformatics, data mining, and high-performance computing, and from time-to-time, he looks at various problems in the areas of information retrieval, collaborative filtering, and electronic design automation for VLSI CAD.Within these areas, his research focuses in developing novel algorithms for solving important existing and/or emerging problems, and on developing practical software tools implementing some of these algorithms. The results from his research have been presented in various conferences and published in leading peer reviewed journals and highly selective conference proceedings

Program Committee

- Mohit Sharma, University of Minnesota, Twin Cities
- Rose Catherine Kanjirathinkal,Carnegie Mellon University
- Jianpeng Xu, Michigan State University
- Lingfei Wu, IBM T.J. Watson Research Center
- Magdalini Eirinaki, San Jose State University
- Fuzhen Zhuang, Chinese Academy of Sciences
- Yao Wu, Simon Fraser University
- Miao Lu, Yahoo Research

Schedule (tentative):

9:00am – 9:10am	Workshop opening
9:10am – 10:10am	Invited Talk I: David F. Gleich, Purdue
10:10am – 11:10am	Invited Talk II: Suju Rajan, Criteo Research
11:10am – 12:10pm	Invited Talk III: Adith Swaminathan, Microsoft Research
12:10pm – 1:30pm	Lunch
1:30pm – 2:30pm	Invited Talk IV: Yisong Yue, California Institute of Technology
2:30pm – 3:30pm	Invited Talk V: Jun Wang, Alibaba
3:30pm – 3:50pm	Paper talk I: Understanding Consumer Behavior with Recurrent Neural Networks
3:50pm – 4:10pm	Paper Talk II: Detecting Meaningful Places and Predicting Locations Using Varied K-Means and Hidden Markov Model
4:10pm – 4:30pm	Paper Talk III: Representation Learning of Users and Items for Review Rating Prediction Using Attention-based Convolutional Neural Network
4:30pm – 4:50pm	Paper Talk IV: Collaborative filtering for individual household prediction problem given contextual information
4:50pm – 5:00pm	Paper Talk V: Local Sparse Linear Model Ensemble for Top-N Recommendation
5:00pm – 5:10pm	Paper Talk VI: Science Driven Innovations for Mobile Data Science: Theory, Practices and Lessons Learned
5:10pm – 5:15pm	Workshop closing