GraphLearning'22: 1st International Workshop on Graph Learning

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ABSTRACT

The First Workshop on Graph Learning aims to bring together researchers and practitioners from academia and industry to discuss recent advances and core challenges of graph learning. This workshop will be established as a platform for multiple disciplines such as computer science, applied mathematics, physics, social sciences, data science, complex networks, and systems engineering. Core challenges in regard to theory, methodology, and applications of graph learning will be the main center of discussions at the workshop.

CCS CONCEPTS

• **Computing methodologies → Machine learning**.

KEYWORDS

graph learning, machine learning, network science, network representation learning, graph data

1 INTRODUCTION

Graphs (also known as networks [1]) are a popular and widely-used representation of various complex data, such as World Wide Web, knowledge graphs, social networks, biological networks, traffic networks, citation networks, and communication networks. Graph data are now ubiquitous. Recent years have witnessed a surge of research and development in machine learning with/on graphs thanks to the revival of AI. This is leading to the rapid emergence of the field of graph learning [4]. Built upon theories and techniques from multiple areas, including e.g. AI, machine learning, network science, graph theory, web science, and data science, graph learning as a powerful tool has attracted remarkable attention from many communities. Over the past few years, a lot of effective graph learning models and algorithms (e.g. graph neural networks, network embedding [2], network representation learning [3], etc.) have been

developed to address various challenges in real-world applications, with promising results achieved.

The First Workshop on Graph Learning will be a full-day workshop. In response to the call-for-papers, this first edition of the workshop received 24 submissions by 97 authors from 13 different countries. Each paper was reviewed by at least two members of the program committee. As a result of the rigorous review process, 18 high-quality papers were accepted for presentation at the workshop and inclusion in the proceedings. In addition to paper presentations, the workshop also features 3 Invited Keynote Talks delivered by:

- Prof. Wenjie Zhang, University of New South Wales, Australia
- Prof. Donatello Conte, University of Tours, France
- Prof. Michael Bronstein, University of Oxford, United Kingdom

The workshop will be held in conjunction with The ACM Web Conference 2022. Detailed program of the workshop will be posted on the workshop website: https://graphlearning.net/.

2 SCOPE OF THE WORKSHOP

In this workshop, we desire to explore the most challenging topics in the emerging field of graph learning and seek answers to noteworthy research questions such as:

- What are the core theories and models that underpin graph learning?
- How to build trustworthy and/or responsible AI systems with graph learning?
- Can graph learning be used for large-scale and complex networks/systems?
- When will graph learning fail, and why?
- How should new comers from diverse disciplines be educated so as to take advantage of graph learning?

Topics of interest include but not limited to:

- Foundations and understanding of graph learning
- Novel models and algorithms for graph learning
- Trustworthy graph learning
- Fairness, transparency, explainability, and robustness
- Graph learning on/for the Web
- Graph learning for complex systems and big networks
- Graph learning for social good
- Representation learning
- AI in knowledge graphs
- Lifelong graph learning systems
- Graph learning in various domains
- Graph learning applications, services, platforms, and education

WWW '22 Companion, April 25–29, 2022, Virtual Event, Lyon, France.

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3 PROGRAM COMMITTEE

The Program Committee of this workshop consists of 23 members from around the world, as listed below.

- Saloni Agarwal, University of Texas at Dallas
- Ariful Azad, Indiana University Bloomington
- Lei Bai, University of Sydney
- Tanmoy Chakraborty, Indraprastha Institute of Information Technology Delhi
- Michael Cochez, Vrije Universiteit Amsterdam
- Tyler Derr, Vanderbilt University
- Falih Febrinanto, Federation University Australia
- Mingliang Hou, Dalian University of Technology
- Zhao Kang, University of Electronic Science and Technology of China
- Seyed Mehran Kazemi, Google Research
- Zekarias Kefato, KTH Royal Institute of Technology
- Junhyun Lee, Korea University
- Radosław Michalski, Wrocław University of Science and Technology
- Shirui Pan, Monash University
- Chanyoung Park, Korea Advanced Institute of Science and Technology
- Ciyuan Peng, Federation University Australia
- Jonas Richiardi, University of Lausanne
- Tara Safavi, University of Michigan
- Vivek Sharma, MIT
- Ke Sun, Dalian University of Technology
- Pengyang Wang, University of Macau
- Shan Xue, University of Wollongong
- Leo Yu Zhang, Deakin University

4 WORKSHOP ORGANIZERS

Feng Xia received the BSc and PhD degrees from Zhejiang University, Hangzhou, China. He was Full Professor and Associate Dean (Research) in School of Software, Dalian University of Technology, China. He is Associate Professor and former Discipline Leader (IT) in School of Engineering, IT and Physical Sciences, Federation University Australia. Dr. Xia has published 2 books and over 300 scientific papers in international journals and conferences (such as IEEE TAI, TKDE, TNNLS, TBD, TCSS, TNSE, TETCI, TC, TMC, TPDS, TETC, THMS, TVT, TITS, TASE, ACM TKDD, TIST, TWEB, TOMM, WWW, AAAI, SIGIR, CIKM, JCDL, EMNLP, and INFOCOM). His research interests include data science, artificial intelligence, graph learning, anomaly detection, and systems engineering. He is a Senior Member of IEEE and ACM.

Renaud Lambiotte is a Professor of Networks and Nonlinear Systems at the University of Oxford. His main research interests are the modelling and analysis of large networks, with a particular focus on clustering and temporal networks, and applications in social and neuronal systems. He is Associate Editor for Science Advances, a Turing Fellow and Tutorial Fellow at Somerville College. Renaud Lambiotte has a PhD in Physics from the Université Libre de Bruxelles, and has previously been postdoc at ENS Lyon, Université de Liège, UCLouvain and Imperial College London, and Professor in Mathematics at the University of Namur. Dr. Lambiotte has published around 120 research articles in international, peer-review

journals, a dozen book chapters and two books, A Guide to temporal networks, World Scientific, 2017, and Dynamics and Modularity on Complex Networks, Cambridge University Press, 2021.

Charu C. Aggarwal is a Distinguished Research Staff Member (DRSM) at the IBM T. J. Watson Research Center in Yorktown Heights, New York. He has published more than 400 papers in refereed conferences and journals, and has applied for or been granted more than 80 patents. He is author or editor of 20 books, including textbooks on linear algebra, machine learning (for text), neural networks, recommender systems, and outlier analysis. Because of the commercial value of his patents, he has thrice been designated a Master Inventor at IBM. He has received several internal and external awards, including the EDBT Test-of-Time Award (2014), the ACM SIGKDD Innovation Award (2019), and the IEEE ICDM Research Contributions Award (2015). He is also a recipient of the W. Wallace McDowell Award, which is the highest technical honor given by IEEE Computer Society in the field of computer science. He has served as an editor-in-chief of the ACM SIGKDD Explorations. He is currently serving as the editor-in-chief of the ACM Transactions on Knowledge Discovery from Data and as an editor-in-chief of ACM Books. He is a fellow of the SIAM, ACM, and the IEEE.

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