Graph Machine Learning: NeurIPS 2020 Papers

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How hot is graph neural networks, more generally, graph machine learning, in NeurIPS 2020? Please check out our summary below. It is worth noting that this may not be a complete list.

1 IMPROVEMENT OF GRAPH NEURAL NETWORKS (GNNS) (30)

1.1 Overcoming Over-smoothness (3)

1. **Scattering GCN: Overcoming Oversmoothness in Graph Convolutional Networks**
   Authors: Yimeng Min (MILA) · Frederik Wenkel (Mila, Université de Montréal) · Guy Wolf (Université de Motréal; Mila)
   Sketch: Novel transition matrix – graph scatter. Novel architecture (multiple transition matrices and residual connection). Theoretical basis: band-filters in graph signal processing.

2. **Optimization and Generalization Analysis of Transduction through Gradient Boosting and Application to Multi-scale Graph Neural Networks**
   Authors: Kenta Oono (The University of Tokyo, Preferred Networks Inc.) · Taiji Suzuki (The University of Tokyo/RIKEN-AIP)
   Sketch: Theoretical support for multi-scale GNNs. Novel training algorithm for multi-scale GNNs – gradient boosting.

3. **Towards Deeper Graph Neural Networks with Differentiable Group Normalization**
   Authors: Kaixiong Zhou (Texas A&M University) · Xiao Huang (The Hong Kong Polytechnic University) · Yuening Li (Texas A&M University) · Daochen Zha (Texas A&M University) · Rui Chen (Samsung Research America) · Xia Hu (Texas A&M University)
   Sketch: Novel normalization method – DGN, which normalizes nodes within the same group independently to increase their smoothness, and separates node distributions among different groups to significantly alleviate the over-smoothing issue.

1.2 Graph Pooling (4)

1. **Graph Cross Networks with Vertex Infomax Pooling**
   Authors: Maosen Li (Shanghai Jiao Tong University) · Siheng Chen (MERL) · Ya Zhang (Cooperative Medianet Innovation Center, Shang hai Jiao Tong University) · Ivor Tsang (University of Technology, Sydney)

Sketch: Novel GNNs architecture – graph cross network (GXN). Novel pooling opeartor – vertex infomax pooling (VIPool).

2. **Rethinking pooling in graph neural networks**
   Authors: Diego Mesquita (Aalto University) · Amauri Souza (Federal Institute of Ceara) · Samuel Kaski (Aalto University and University of Manchester)
   Sketch: Theoretical analysis for pooling operator in GNNs.

3. **DiffGCN: Graph Convolutional Networks via Differential Operators and Algebraic Multigrid Pooling**
   Authors: Moshe Eliasof (Ben-Gurion University of the Negev) · Eran Treister (Ben-Gurion University of the Negev)
   Sketch: Novel approaches for graph convolution, pooling and unpooling. Idea sources: finite-elements and algebraic multigrid frameworks.

4. **Path Integral Based Convolution and Pooling for Graph Neural Networks**
   Authors: Zheng Ma (Princeton University) · Junyu Xuan (University of Technology Sydney) · Yu Guang Wang (University of New South Wales; MPI MiS) · Ming Li (Zhejiang Normal University) · Pietro Liò (University of Cambridge)
   Sketch: Novel path integral based graph neural networks (PAN) – novel transition matrix and adaptive pooling operator. Idea sources: physics.

1.3 Graph Structure Learning (2)

NOTE: Both of the two papers are related to graph attack/robustness.

1. **Iterative Deep Graph Learning for Graph Neural Networks: Better and Robust Node Embeddings**
   Authors: Yu Chen (Facebook) · Lingfei Wu (IBM Research AI) · Mohammed Zaki (RPI)
   Sketch: Novel learning framework that jointly and iteratively learning graph structure and graph embedding.

2. **Variational Inference for Graph Convolutional Networks in the Absence of Graph Data and Adversarial Settings**
   Authors: Pantelis Elinas (Data61) · Edwin Bonilla (Data61) · Louis C. Tiao (University of Sydney)
   Sketch: Build a graph generative model for GCNs, and learn the parameter of generative model and GCNs jointly.

1.4 Explainers for GNNs (2)

1. **Parameterized Explainer for Graph Neural Network**
   Authors: Dongsheng Luo (The Pennsylvania State University) · Wei Cheng (NEC Labs America) · Dongkuan Xu (The Pennsylvania State University) · Wenchao Yu (UCLA) · Bo Zong (NEC Labs) · Haifeng Chen (NEC Labs America) · Xiang Zhang (The Pennsylvania State University)
   Sketch: -

2. **PGM-Explainer: Probabilistic Graphical Model Explanations for Graph Neural Networks**
   Authors: Minh N Vu (University of Florida) · My T. Thai (University of Florida)
   Sketch: Probabilistic Graphical Model (PGM) based GNN explainer.

1.5 Others (19)

1. **Factorizable Graph Convolutional Networks**
   Authors: Yiding Yang (Stevens Institute of Technology) · Zunlei Feng (Zhejiang University) · Mingli Song (Zhejiang University) · Xinchao Wang (Stevens Institute of Technology)
   Sketch: Novel transformation matrix and GNN layer which disentangle the original graph into several factorized graphs and propagate on each factor respectively.

2. **Factor Graph Neural Networks**
   Authors: Zhen Zhang (University of Adelaide) · Fan Wu (Nanjing University) · Wee Sun Lee (National University of Singapore)
   Sketch: Generalize the graph neural network into a factor graph neural network (FGNN) in order to capture higher order dependencies. Experiments are carried on point could datasets.

3. **Building powerful and equivariant graph neural networks with message-passing**
   Authors: Clément Vignac (EPFL) · Andreas Loukas (EPFL) · Pascal Frossard (EPFL)
   Sketch: Novel message-passing framework that is powerful while preserving permutation equivalence.

4. **Graphon Neural Networks and the Transferability of Graph Neural Networks**
   Authors: Luana Ruiz (University of Pennsylvania) · Luiz Chamon (University of Pennsylvania) · Alejandro Ribeiro (University of Pennsylvania)
   Sketch: Study the transferability of GNNs.

5. **Principal Neighbourhood Aggregation for Graph Nets**
   Authors: Gabriele Corso (University of Cambridge) · Luca Cavalleri (University of Cambridge) · Dominique Beaini (Invivo AI) · Pietro Liò (University of Cambridge) · Petar Veličković (DeepMind)
   Sketch: GNN with multiple aggregators.

6. **Implicit Graph Neural Networks**
   Authors: Fangda Gu (UC Berkeley) · Heng Chang (Tsinghua University) · Wenwu Zhu (Tsinghua University) · Somayeh Sojoudi (University of California, Berkeley) · Laurent El Ghaoui (UC Berkeley)
   Sketch: Novel GNN – Implicit Graph Neural Networks to capture long-range dependencies in underlying graphs. Theoretical basis: Perron-Frobenius theory.

7. **Natural Graph Networks**
   Authors: Pim de Haan (Qualcomm AI Research, University of Amsterdam) · Taco Cohen (Qualcomm AI Research) · Max Welling (University of Amsterdam / Qualcomm AI Research)
   Sketch: Novel message passing algorithm to make the network equivariant to local and global graph isomorphisms.

8. **Unsupervised Joint k-node Graph Representations with Compositional Energy-Based Models**
   Authors: Leonardo Cotta (Purdue University) · Carlos H. C. Teixeira (Universidade Federal de Minas Gerais) · Ananthram Swami (Army Research Laboratory, Adelphi) · Bruno Ribeiro (Purdue)
   Sketch: Propose MHM-GNN, an inductive unsupervised graph representation approach

that combines joint k-node representations with energy-based models (hypergraph Markov networks) and GNNs.

9. **Can Graph Neural Networks Count Substructures?**
Authors: Zhengdao Chen (New York University) · Lei Chen (New York University) · Soledad Villar (New York University) · Joan Bruna (NYU)
Sketch: Study the ability of substructure counting (e.g., matching-count and containment-count) of GNNs. Have theoretical analysis and experiments to support the conclusion.

10. **How hard is to distinguish graphs with graph neural networks?**
Authors: Andreas Loukas (EPFL)
Sketch: -

11. **Graph Random Neural Networks for Semi-Supervised Learning on Graphs**
Authors: Wenzheng Feng (Tsinghua University) · Jie Zhang (Webank Co.,Ltd) · Yuxiao Dong (Microsoft) · Yu Han (Tsinghua University) · Huanbo Luan (Tsinghua University) · Qian Xu (WeBank) · Qiang Yang (WeBank and HKUST) · Evgeny Kharlamov (Bosch Center for Artificial Intelligence) · Jie Tang (Tsinghua University)
Sketch: -

12. **Graph Stochastic Neural Networks for Semi-supervised Learning**
Authors: Haibo Wang (Tsinghua University) · Chuan Zhou (Chinese Academy of Sciences) · Xin Chen (Institute for Network Sciences and Cyberspace, Tsinghua University) · Jia Wu (Macquarie University) · Shirui Pan (Monash University) · Jilong Wang (Tsinghua University)
Sketch: -

13. **Random Walk Graph Neural Networks**
Authors: Giannis Nikolentzos (Athens University of Economics and Business) · Michalis Vazirgiannis (École Polytechnique)
Sketch: -

14. **Dirichlet Graph Variational Autoencoder**
Authors: Jia Li (The Chinese University of Hong Kong) · Jianwei Yu (CUHK) · Jiajin Li (The Chinese University of Hong Kong) · Honglei Zhang (Georgia Institute of Technology) · Kangfei Zhao (The Chinese University of Hong Kong) · Yu Rong (Tencent AI Lab) · Hong Cheng (The Chinese University of Hong Kong) · Junzhou Huang (University of Texas at Arlington / Tencent AI Lab)
Sketch: -

15. **Convergence and Stability of Graph Convolutional Networks on Large Random Graphs**
Authors: Nicolas Keriven (CNRS, GIPSA-lab) · Alberto Bietti (Inria) · Samuel Vaiter (CNRS)
Sketch: -

16. **Design Space for Graph Neural Networks**
Authors: Jiaxuan You (Stanford University) · Zhitao Ying (Stanford University) · Jure Leskovec (Stanford University and Pinterest)
Sketch: -

17. **Graph Geometry Interaction Learning**

Authors: Shichao Zhu (Institute of Information Engineering, Chinese Academy of Sciences) · Shirui Pan (Monash University) · Chuan Zhou (Chinese Academy of Sciences) · Jia Wu (Macquarie University) · Yanan Cao (Institute of Information Engineering, Chinese Academy of Sciences) · Bin Wang (Xiaomi AI Lab)
Sketch: -

18. **Attribution for Graph Neural Networks**
Authors: Benjamin Sanchez-Lengeling (Google Research) · Jennifer Wei (Google Research) · Brian Lee (Google Inc.) · Emily Reif (Google) · Peter Wang (Columbia University) · Wesley Wei Qian (University of Illinois at Urbana-Champaign) · Kevin McCloskey (Google) · Lucy Colwell (Google) · Alexander Wiltschko (Google Brain)
Sketch: -

19. **Beyond Homophily in Graph Neural Networks: Current Limitations and Effective Designs**
Authors: Jiong Zhu (University of Michigan) · Yujun Yan (University of Michigan) · Lingxiao Zhao (Carnegie Mellon University) · Mark Heimann (University of Michigan) · Leman Akoglu (CMU) · Danai Koutra (U Michigan)
Sketch: -

2 Adversarial Attack & Defense (5)

1. **Adversarial Attack on Graph Neural Networks with Limited Node Access**
Authors: Jiaqi Ma (University of Michigan) · Shuangrui Ding (University of Michigan) · Qiaozhu Mei (University of Michigan)
Sketch: Novel graph attack setting: limited node access. Novel greedy procedure-based method to solve the attack problem.

2. **GNNGuard: Defending Graph Neural Networks against Adversarial Attacks**
Authors: Xiang Zhang (Harvard University) · Marinka Zitnik (Harvard University)
Sketch: Novel defense method for graph defense. Theoretical basis: theory of homophily.

3. **Certified Robustness of Graph Convolution Networks for Graph Classification under Topological Attacks**
Authors: Hongwei Jin (University of Illinois at Chicago) · Zhan Shi (University of Illinois at Chicago) · Venkata Jaya Shankar Ashish Peruri (University of Illinois at Chicago) · Xinhua Zhang (UIC)
Sketch: -

4. **Adversarial Attacks on Deep Graph Matching**
Authors: Zijie Zhang (Auburn University) · Zeru Zhang (Auburn University) · Yang Zhou (Auburn University) · Yelong Shen (Microsoft Dynamics 365 AI) · Ruoming Jin (Kent State University) · Dejing Dou (" University of Oregon, USA")
Sketch: -

5. **Reliable Graph Neural Networks via Robust Location Estimation**
Authors: Simon Geisler (Technical University of Munich) · Daniel Zügner (Technical University of Munich) · Stephan Günnemann (Technical University of Munich)
Sketch: -

3 Graph Self-supervised Learning (3)

1. **Self-supervised Auxiliary Learning with Meta-paths for Heterogeneous Graphs**
   Authors: Dasol Hwang (Korea University) · Jinyoung Park (Korea University) · Sunyoung Kwon (Pusan National University) · KyungMin Kim (Seoul National University) · Jung-Woo Ha (Clova AI Research, NAVER Corp.) · Hyunwoo Kim (Korea University)
   Sketch: Design novel (meta-path-based) self-supervised tasks for heterogeneous graphs.

2. **GROVER: Self-Supervised Message Passing Transformer on Large-scale Molecular Graphs**
   Authors: Yu Rong (Tencent AI Lab) · Yatao Bian (Tencent AI Lab) · Tingyang Xu (Tencent AI Lab) · Weiyang Xie (Tencent AI Lab) · Ying WEI (Tencent AI Lab) · Wenbing Huang (Tsinghua University) · Junzhou Huang (University of Texas at Arlington / Tencent AI Lab)
   Sketch: Novel self-supervised framework (specially designed for molecules), including model (GNN+transformer) and self-supervised tasks. The model is trained on a super-large dataset (10m graphs). SOTA.

3. **Pre-Training Graph Neural Networks: A Contrastive Learning Framework with Augmentations**
   Authors: Yuning You (Texas A&M University) · Tianlong Chen (Unversity of Texas at Austin) · Yongduo Sui (University of Science and Technology of China) · Ting Chen (Google) · Zhangyang Wang (University of Texas at Austin) · Yang Shen (Texas A&M University)
   Sketch: -

4 Scalable Graph Learning (3)

1. **Bandit Samplers for Training Graph Neural Networks**
   Authors: Ziqi Liu (Ant Group) · Zhengwei Wu (Ant Financial) · Zhiqiang Zhang (Ant Financial Services Group) · Jun Zhou (Ant Financial) · Shuang Yang (Ant Financial) · Le Song (Ant Financial Services Group) · Yuan Qi (Ant Financial Services Group)
   Sketch: Novel sampler that considers the changing aggregator's weights.

2. **GCOMB: Learning Budget-constrained Combinatorial Algorithms over Billion-sized Graphs**
   Authors: Sahil Manchanda (IIT Delhi) · AKASH MITTAL (IIT Delhi) · Anuj Dhawan (Indian Institute of Technology Delhi) · Sourav Medya (Kellogg School of Management, Northwestern University) · Sayan Ranu (IIT Delhi) · Ambuj K Singh (UNIVERSITY OF CALIFORNIA, SANTA BARBARA)
   Sketch: -

3. **Scalable Graph Neural Networks via Bidirectional Propagation**
   Authors: Ming Chen (Renmin University of China) · Zhewei Wei (Renmin University of China) · Bolin Ding ("Data Analytics and Intelligence Lab, Alibaba Group") · Yaliang Li (Alibaba Group) · Ye Yuan (Beijing Institute of Technology) · Xiaoyong Du (Renmin University of China) · Ji-Rong Wen (Renmin University of China)
   Sketch: -

5 SPATIAL-TEMPORAL / DYNAMIC / STREAMING GRAPH (4)

1. **Pointer Graph Networks**
   Authors: Petar Veličković (DeepMind) · Lars Buesing (Google DeepMind) · Matthew Overlan (DeepMind) · Razvan Pascanu (Google DeepMind) · Oriol Vinyals (Google DeepMind) · Charles Blundell (DeepMind)
   Sketch: Propose Pointer Graph Networks (PGNs) which augment sets or graphs with additional inferred edges for improved model expressivity. PGNs allow each node to dynamically point to another node, followed by message passing over these pointers.

2. **Adaptive Graph Convolutional Recurrent Network for Traffic Forecasting**
   Authors: LEI BAI (UNSW, Sydney) · Lina Yao (University of New South Wales) · Can Li (University of New South Wales) · Xianzhi Wang (University of Technology Sydney) · Can Wang (Griffith University)
   Sketch: GNN + RNN + graph structure learning. (Similar to Zonghan's Work!!)

3. **Adaptive Shrinkage Estimation for Streaming Graphs**
   Authors: Nesreen Ahmed (Intel Labs) · Nick Duffield (Texas A&M University)
   Sketch: -

4. **Spectral Temporal Graph Neural Network for Multivariate Time-series Forecasting**
   Authors: Defu Cao (Peking University) · Yujing Wang (MSRA) · Juanyong Duan (Microsoft) · Ce Zhang (ETH Zurich) · Xia Zhu (Microsoft) · Congrui Huang (Microsoft) · Yunhai Tong (Peking University) · Bixiong Xu (Microsoft) · Jing Bai (Microsoft) · Jie Tong (Microsoft) · Qi Zhang (Microsoft)
   Sketch: -

6 APPLICATION OF GNNS (15)

6.1 GNNs × Graph-related Tasks (3)

1. **Graduated Assignment for Joint Multi-Graph Matching and Clustering with Application to Unsupervised Graph Matching Network Learning**
   Authors: Runzhong Wang (Shanghai Jiao Tong University) · Junchi Yan (Shanghai Jiao Tong University) · Xiaokang Yang (Shanghai Jiao Tong University)
   Sketch: -

2. **On the equivalence of molecular graph convolution and molecular wave function with poor basis set**
   Authors: Masashi Tsubaki (National Institute of Advanced Industrial Science and Technology (AIST)) · Teruyasu Mizoguchi (University of Tokyo)
   Sketch: -

3. **Towards Scale-Invariant Graph-related Problem Solving by Iterative Homogeneous GNNs**
   Authors: Hao Tang (Shanghai Jiao Tong University) · Zhiao Huang (University of California San Diego) · Jiayuan Gu (University of California, San Diego) · Bao-Liang Lu (Shanghai Jiao Tong University) · Hao Su (UCSD)
   Sketch: -

6.2 GNNs × CV (3)

1. **Learning Physical Graph Representations from Visual Scenes**
   Authors: Daniel Bear (Stanford University) · Chaofei Fan (Stanford) · Damian Mrowca (Stanford University) · Yunzhu Li (MIT) · Seth Alter (MIT) · Aran Nayebi (Stanford University) · Jeremy Schwartz (MIT) · Li Fei-Fei (Stanford University & Google) · Jiajun Wu (Google) · Josh Tenenbaum (MIT) · Daniel Yamins (Stanford University)
   Sketch: Build "Physical Scene Graphs", with nodes in the hierarchy corresponding intuitively to object parts at different scales, and edges to physical connections between parts. Describe PSGNet, a network architecture that learns to extract PSGs by reconstructing scenes through a PSG-structured bottleneck.

2. **Multimodal Graph Networks for Compositional Generalization in Visual Question Answering**
   Authors: Raeid Saqur (Princeton University) · Karthik Narasimhan (Princeton University)
   Sketch: -

3. **GPS-Net: Graph-based Photometric Stereo Network**
   Authors: Zhuokun Yao (Tianjin University) · Kun Li (Tianjin University) · Ying Fu (Beijing Institute of Technology) · Haofeng Hu (Tianjin University) · Boxin Shi (Peking University)
   Sketch: -

6.3 GNNs × NLP (4)

1. **Learning Graph Structure with A Finite-State Automaton Layer**
   Authors: Daniel Johnson (Google Research, Brain Team) · Hugo Larochelle (Google Brain) · Daniel Tarlow (Google Brain)
   Sketch: Study the problem of learning to derive abstract relations from the intrinsic graph structure to solve the variable misuse program understanding task.

2. **Strongly Incremental Constituency Parsing with Graph Neural Networks**
   Authors: Kaiyu Yang (Princeton University) · Jia Deng (Princeton University)
   Sketch: -

3. **Learning to Execute Programs with Instruction Pointer Attention Graph Neural Networks**
   Authors: David Bieber (Google Brain) · Charles Sutton (Google) · Hugo Larochelle (Google Brain) · Daniel Tarlow (Google Brain)
   Sketch: -

4. **Deep Relational Topic Modeling via Graph Poisson Gamma Belief Network**
   Authors: Chaojie Wang (Xidian University) · Hao Zhang (Xidian University) · Bo Chen (Xidian University) · Dongsheng Wang (Xidian University) · Zhengjue Wang (Xidian University) · Mingyuan Zhou (University of Texas at Austin)
   Sketch: -

6.4 GNNs × RL (3)

1. **Reward Propagation Using Graph Convolutional Networks**
   Authors: Martin Klissarov (Mila/McGill University) · Doina Precup (McGill University / Mila / DeepMind Montreal)

Sketch: Leverage Graph Convolutional Networks to perform message passing from rewarding states for reinforcement learning.

2. **Graph Policy Network for Transferable Active Learning on Graphs**
   Authors: Shengding Hu (Tsinghua University) · Zheng Xiong (Tsinghua University / University of Oxford) · Meng Qu (Mila) · Xingdi Yuan (Microsoft Research) · Marc-Alexandre Côté (Microsoft Research) · Zhiyuan Liu (Tsinghua University) · Jian Tang (Mila)
   Sketch: Active learning method for the labelling of nodes with GNNs. Model the problem with RL.

3. **Can Q-Learning with Graph Networks Learn a Generalizable Branching Heuristic for a SAT Solver?**
   Authors: Vitaly Kurin (University of Oxford) · Saad Godil (NVIDIA) · Shimon Whiteson (University of Oxford) · Bryan Catanzaro (NVIDIA)
   Sketch: -

6.5 GNNs × Others (2)

1. **Generative 3D Part Assembly via Dynamic Graph Learning**
   Authors: Jialei Huang (Peking University) · Guanqi Zhan (Peking University) · Qingnan Fan (Stanford University) · Kaichun Mo (Stanford University) · Lin Shao (Stanford University) · Baoquan Chen (Shandong University) · Leonidas J Guibas (stanford.edu) · Hao Dong (Peking University)
   Sketch: Use dynamic GNN to model the part assembly refinements and their relation.

2. **Multipole Graph Neural Operator for Parametric Partial Differential Equations**
   Authors: Zongyi Li (Caltech) · Nikola Kovachki (California Institute of Technology) · Kamyar Azizzadenesheli (Caltech) · Burigede Liu (caltech) · Andrew Stuart (California Institute of Technology) · Kaushik Bhattacharya (Caltech) · Anima Anandkumar (NVIDIA / Caltech)
   Sketch: Novel multi-level graph neural network to learn mesh-invariant solutions operators to parametric PDEs.

7 OTHERS (25)

7.1 Graph Embedding (4)

1. **Weisfeiler and Leman go sparse: Towards scalable higher-order graph embeddings**
   Authors: Christopher Morris (Polytechnique Montreal) · Gaurav Rattan (RWTH Aachen University) · Petra Mutzel (University of Bonn)
2. **Curvature Regularization to Prevent Distortion in Graph Embedding**
   Authors: Hongbin Pei (Jilin University) · Bingzhe Wei (University of Illinois at Urbana-Champaign) · Kevin Chang (University of Illinois at Urbana-Champaign) · Chunxu Zhang (Jilin University) · Bo Yang (Jilin University)
3. **Handling Missing Data with Graph Representation Learning**
   Authors: Jiaxuan You (Stanford University) · Xiaobai Ma (Stanford University) · Yi Ding (Stanford University) · Mykel J Kochenderfer (Stanford University) · Jure Leskovec (Stanford University and Pinterest)
4. **Manifold structure in graph embeddings**
   Authors: Patrick Rubin-Delanchy (University of Bristol)

7.2 Knowledge Graph (3)

1. **Beta Embeddings for Multi-Hop Logical Reasoning in Knowledge Graphs**
   Authors: Hongyu Ren (Stanford University) · Jure Leskovec (Stanford University and Pinterest)
2. **Searching Recurrent Architecture for Path-based Knowledge Graph Embedding**
   Authors: Yongqi Zhang (4Paradigm Inc.) · Quanming Yao (4paradigm) · Lei Chen (Hong Kong University of Science and Technology)
3. **Duality-Induced Regularizer for Tensor Factorization Based Knowledge Graph Completion**
   Authors: Zhanqiu Zhang (University of Science and Technology of China) · Jianyu Cai (University of Science and Technology of China) · Jie Wang (University of Science and Technology of China)

7.3 Graph Benchmark (1)

1. **Open Graph Benchmark: Datasets for Machine Learning on Graphs**
   Authors: Weihua Hu (Stanford University) · Matthias Fey (TU Dortmund University) · Marinka Zitnik (Harvard University) · Yuxiao Dong (Microsoft) · Hongyu Ren (Stanford University) · Bowen Liu (Stanford University) · Michele Catasta (Stanford University) · Jure Leskovec (Stanford University and Pinterest)

7.4 Graph Meta Learning (2)

1. **Node Classification on Graphs with Few-Shot Novel Labels via Meta Transformed Network Embedding**
   Authors: Lin Lan (Xi'an Jiaotong University) · Pinghui Wang (Xi'an Jiaotong University) · Xuefeng Du (Xi'an Jiaotong University) · Kaikai Song (Huawei Noah's Ark Lab) · Jing Tao (Xi'an Jiaotong University) · Xiaohong Guan (Xi'an Jiaotong University)
2. **Graph Meta Learning via Local Subgraphs**
   Authors: Kexin Huang (Harvard University) · Marinka Zitnik (Harvard University)

7.5 Community Detection (2)

1. **Provable Overlapping Community Detection in Weighted Graphs**
   Authors: Jimit Majmudar (University of Waterloo) · Stephen Vavasis (University of Waterloo)
2. **Community detection in sparse time-evolving graphs with a dynamical Bethe-Hessian**
   Authors: Lorenzo Dall'Amico (GIPSA lab) · Romain Couillet (CentralSupélec) · Nicolas Tremblay (CNRS)

7.6 Graph Clustering (2)

1. **On the Power of Louvain for Graph Clustering**
   Authors: Vincent Cohen-Addad (CNRS & Sorbonne Université) · Adrian Kosowski (NavAlgo) · Frederik Mallmann-Trenn (King's College London) · David Saulpic (Ecole normale supérieure)
2. **Strongly local p-norm-cut algorithms for semi-supervised learning and local graph clustering**
   Authors: Meng Liu (Purdue University) · David Gleich (Purdue University)

7.7 Spectral Clustering (1)

1. **Higher-Order Spectral Clustering of Directed Graphs**

Authors: Valdimar Steinar Ericsson Laenen (FiveAI) · He Sun (School of Informatics, The University of Edinburgh)

7.8 Link prediction (1)

1. **Learning to Extrapolate Knowledge: Transductive Few-shot Out-of-Graph Link Prediction**
   Authors: Jinheon Baek (KAIST) · Dong Bok Lee (KAIST) · Sung Ju Hwang (KAIST, AITRICS)

7.9 Others (indistinguishable) (9)

1. **Graph Information Bottleneck**
   Authors: Tailin Wu (Stanford) · Hongyu Ren (Stanford University) · Pan Li (Stanford University - Purdue University) · Jure Leskovec (Stanford University and Pinterest)
2. **Binary Matrix Completion with Hierarchical Graph Side Information**
   Authors: Adel Elmahdy (University of Minnesota) · Junhyung Ahn (KAIST) · Changho Suh (KAIST) · Soheil Mohajer (University of Minnesota)
3. **Universal Function Approximation on Graphs**
   Authors: Rickard Gabrielsson (Stanford University)
4. **Less is More: A Deep Graph Metric Learning Perspective Using Few Proxies**
   Authors: Yuehua Zhu (Xidian University) · Muli Yang (Xidian University) · Cheng Deng (Xidian University) · Wei Liu (Tencent AI Lab)
5. **COPT: Coordinated Optimal Transport on Graphs**
   Authors: Yihe Dong (Microsoft) · Will Sawin (Columbia University)
6. **A graph similarity for deep learning**
   Authors: Seongmin Ok (Samsung Advanced Institute of Technology)
7. **Set2Graph: Learning Graphs From Sets**
   Authors: Hadar Serviansky (Weizmann Institute of Science) · Nimrod Segol (Weizmann Institute of Science) · Jonathan Shlomi (Weizmann Institute of Science) · Kyle Cranmer (New York University) · Eilam Gross (Weizmann Institute of Science) · Haggai Maron (NVIDIA Research) · Yaron Lipman (Weizmann Institute of Science)
8. **Stochastic Deep Gaussian Processes over Graphs**
   Authors: Naiqi Li (Tsinghua-Berkeley Shenzhen Institute) · Wenjie Li (Tsinghua University) · Jifeng Sun (Tsinghua University) · Yinghua Gao (Tsinghua University) · Yong Jiang (Tsinghua) · Shu-Tao Xia (Tsinghua University)
9. **Uncertainty Aware Semi-Supervised Learning on Graph Data**
   Authors: Xujiang Zhao (The University of Texas at Dallas) · Feng Chen (UT Dallas) · Shu Hu (University at Buffalo, State University of New York) · Jin-Hee Cho (Virginia Tech)