JIAN TANG

Assistant Professor, Core Faculty Member at Mila; HEC Montréal; CIFAR AI Chair

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RESEARCH INTERESTS

Deep Learning, Graph Representation Learning, Graph Neural Networks, Deep Generative Models, Knowledge Graphs, Drug Discovery, Material Discovery

EDUCATION

Visiting Research Fellow, Carnegie Mellon University   *2017.4-2017.6*
Advisor: Ruslan Salakhutdinov

Research Fellow, University of Michigan, MI, USA   *2016.10-2017.6*
Advisor: Qiaozhu Mei, Xuanlong Nguyen

Ph.D. of Computer Science, Peking University, Beijing, China   *2009-2014*
Dissertation: Study on the limiting factors of statistical topic modeling.
Advisor: Ming Zhang

Visiting Ph.D. student, University of Michigan, MI, USA   *2011.10-2013.8*
Advisor: Qiaozhu Mei, Xuanlong Nguyen

B.S. of Mathematics, Beijing Normal University, Beijing, China   *2005-2009*
Thesis: A tree-structure conditional random field for Web information extraction.
Advisor: Haiyang Huang

EMPLOYMENT

Core Faculty Member, Mila-Quebec AI Institute (founded by Yoshua Bengio) *2017.12-Now*
Assistant Professor, HEC Montréal   *2017.12-Now*
Postdoc Fellow, University of Michigan & Carnegie Mellon University   *2016.10-2017.6*
Associate Researcher II, Microsoft Research Asia, Beijing, China   *2014.7-2016.9*
Research intern, Microsoft Research Asia, Beijing, China   *2010.9-2011.8*

SELECTED AWARDS

[1] **2020 AI2000 Most Influential Scholar, AMiner, 2021.4 (Ranked as 1st in Canada and 5st in the world in the field of Information Retrieval, and Ranked as 1st in Canada and 42nd in the world in the field of Data Mining)**

[2] **Tencent AI Lab Rhino-Bird Gift Fund**, 2020.6

[3] **Amazon Faculty Research Award**, 2020.4

[4] **Top-10 Most cited papers at the World Wide Web (WWW) conference, 2015-2019 (Two of my papers are selected and ranked 1st and 8th respectively).**

[5] **2020 AI2000 Most Influential Scholar Honorable Mention, AMiner**

[6] **Named to first cohort of Canada CIFAR Artificial Intelligence Chairs (CIFAR AI Chair)**, 2019.1-2024.1

[7] **NSERC Discovery Launch Supplement Award to Early Career Researcher**, 2019.3

[8] **Best paper at the 1st International Workshop on Deep Learning Practice for High-Dimensional Sparse Data with KDD**, 2019.8

[9] **Most Cited Paper (paper "LINE: Large-scale Information Network Embedding", 1,802 citations until 2020.1.)** The World Wide Web Conference 2015 (WWW 2015)

[10] **Best Paper Nomination** The World Wide Web Conference 2016 (WWW 2016) (5 out of over 700 submissions)

[11] **Best Paper Award** The International Conference on Machine Learning 2014 (ICML 2014) (1 out of over 1,500 submissions)

RESEARCH GRANTS (CANADIAN DOLLARS BY DEFAULT)

[1] Research Grant "Pretraining molecular and protein representation with 3D structures" with IBM, PI. $76,000 (with an additional 1-1 matching funding from Ministre de l'conomie et de l'Innovation (MEI) funding at Mila), 2021-2022.

[2] Research Grant "Geometric deep learning for molecular modeling" with Samsung, PI. $30,000, 2021-2022.

[3] "FACS- The Acuity-Qc consortium: predicting and imaging drug action" funded by Consortium qubcois sur la dcouverte du mdicamen (CQDM) and the Ministre de lconomie et de lInnovation (MEI), co-PI, with ric Marsault (PI) and many other professors at University of Sherbrooke, Yoshua Bengio, Doina Precup, Amin Emad, Pierre-Luc Bacon. Total funding: $ 13,850,000, $684,960 (Mila part).

[4] Research Grant "Learning logic rules over knowledge graphs for personalization" with LG Corp., PI, $100,000, 2021-2022.

[5] Collaborative Research and Development Grant on "Graph Representation Learning with Limited Labeled Data for Property Prediction in Design" with National Research Council Canada, PI, $200,000, 2021-2023

[6] Samsung Deep Learning Award, Part of an award to Mila funding a select number of core Mila members for Deep Learning research and applications. Co-PI, $4.2M USD, 2020-2023. (191,430 $USD to my part and Renewable for an additional 2 years).

[7] Research Grant by Bill and Melinda Gates Foundation "Project RE: Coalition to Identify COVID-19 Therapeutic Candidates 2020", Scientific Advisor, $1,690,000, 2020. (0% to my part).

[8] IVADO Fundamental Research Projects Grant, "Unified Approach to Graph-Structure Utilization in Data Science", Co-PI, with Guy Wolf (PI), Will Hamiltion, $225,000. (33% to my part), 2020-2022.

[9] Tencent AI Lab Rhino-Bird Gift Fund, PI, $70,000, 2020.6-2021.6.

[10] CIFAR Catalyst COVID-19 Grant "Leveraging Biomedical Knowledge Graphs for COVID-19 Drug Repurposing Strategies", PI, with Co-PIs Will Hamilton, Yoshua Bengio, Guy Wolf, Yue Li, $15,000, 2020.5-2020.12.

[11] Amazon Faculty Research Award,"Deep Active Learning for Graph Neural Networks", PI, $100,000 and $28000 AWS Credits, 2020-2021.

[12] Collaborative Research and Development Grant on "Intelligent Design through Graph Generation with Deep Generative Models and Reinforcement Learning" with National Research Council Canada, PI, $200,000, 2020-2022.

[13] Microsoft-Mila collaboration grant on "Towards Combining Statistical Relational Learning and Graph Neural Networks for Reasoning", PI, $51,000, 2020-2021.

[14] Computational Infrastructure Grant on "Deep Learning for Recommender Systems", Canada Foundation for Innovation (CFI), Co-lead PI with Laurent Charlin, $356,994. (50% to my part), 2020-2023.

[15] Microsoft-Mila collaboration grant on "Learning and Reasoning with Graph Structures in Interactive Text Environments", PI, Co-lead PI with Will Hamilton, $51,000 (100% to my part), 2019-2020.

[16] CIFAR AI Research Chair, PI, $1,050,000, 2019-2024.

[17] NSERC Discovery Launch Supplement Award to Early Career Researcher, PI, $12,500, 2018-2019

[18] NSERC Discovery Grant, "Learning representations of networks", PI, $195,000, 2018-2013

[19] IVADO fundamental research program, "Knowledge-based Question Answering and Information Retrieval", with Jian-Yun Nie (PI), Philippe Langlais, Alain Tapp. Co-PI, $ 160,500, 2018-2020.

[20] Startup Grant (HEC + IVADO), PI, $100,000.

PUBLICATIONS (GOOGLE SCHOLAR CITATIONS: 7,832, H-INDEX:34)

Note: * means equal contributions (or co-first authors), $^+$ indicates the students I supervised, $^\triangle$ indicates co-corresponding authors.

Journals

[1] Yifan Zhao*, Huiyu Cai^{*+}, Zuobai Zhang$^+$, **Jian Tang**$^\triangle$, Yue Li$^\triangle$. "Learning interpretable cellular and gene signature embeddings from single-cell transcriptomic data ", *Nature Communications*, **12**, Article number:5261 (2021) (**Impact factor: 14.919**)

[2] Cheng Yang, Hao Wang, **Jian Tang**, Chuan Shi, Maosung Sun, Ganqu Cui, Zhiyuan Liu. "Full-Scale Information Diffusion Prediction With Reinforced Recurrent Networks", IEEE Transactions on Neural Networks and Learning Systems, 2021, p. 1-13.

[3] Yadi Zhou*, Fei Wang*, **Jian Tang***, Ruth Nussinov, Feixiong Cheng. Artificial intelligence in COVID-19 drug repurposing., The Lancet Digital Health 2020. (**Impact factor: 24.519**).

[4] Xiaozhi Wang$^+$, Tianyu Gao$^+$, Zhaocheng Zhu$^+$, Zhiyuan Liu, Juanzi Li, **Jian Tang**. KEPLER: A Unified Model for Knowledge Embedding and Pre-trained Language Representation, Transactions of the Association for Computational Linguistics, Vol 9, 2020, p. 176-194

[5] Xuanzhe Liu, Wei Ai, Huoran Li, **Jian Tang**, Gang Huang, and Qiaozhu Mei. Derive User Preferences of Mobile Apps from their Management Activities, ACM Transactions on Information Systems (TOIS), 2017, Volume 35 Issue 4.

[6] Shagun Sodhani$^+$, Meng Qu$^+$, **Jian Tang**. Attending over Triads for Learning Signed Network Embedding. Frontiers in Big Data. Frontiers in Big Data 2 (2019): 6.

Conferences

[1] Zhaocheng Zhu, Zuobai Zhang, Louis-Pascal A. C. Xhonneux, **Jian Tang**. "Neural Bellman-Ford Networks: A General Graph Neural Network Framework for Link Prediction", to appear at NeurIPS'2021

[2] Shitong Luo, Chence Shi, Minkai Xu, **Jian Tang**. " Predicting Molecular Conformation via Dynamic Graph Score Matching", to appear at NeurIPS'2021

[3] Minghao Xu, Meng Qu, Bingbing Ni, **Jian Tang**. " Joint Modeling of Visual Objects and Relations for Scene Graph Generation", to appear at NeurIPS'2021

[4] Andreea Deac, Petar Velikovi, Ognjen Milinkovi, Pierre-Luc Bacon, **Jian Tang**, Mladen Nikolic. " Neural Algorithmic Reasoners are Implicit Planners", to appear at NeurIPS'2021

[5] Louis-Pascal A. C. Xhonneux, Andreea Deac, Petar Velikovi, **Jian Tang**. "How to transfer algorithmic reasoning knowledge to learn new algorithms?", to appear at NeurIPS'2021

[6] Chence Shi[*+], Shitong Luo[*+], Minkai Xu[+], **Jian Tang**. "Learning Gradient Fields for Molecular Conformation Generation", to appear at ICML'2021

[7] Minkai Xu[+], Wujie Wang, Shitong Luo[+], Chence Shi[+], Yoshua Bengio, Rafael Gomez-Bombarelli, **Jian Tang**. "An End-to-End Framework for Molecular Conformation Generation via Bilevel Programming", to appear at ICML'2021

[8] Hangrui Bi[+], Hengyi Wang[+], Chence Shi[+], Connor Coley, **Jian Tang**, Hongyu Guo. "Non-Autoregressive Electron Redistribution Modeling for Reaction Prediction", to appear at ICML'2021

[9] Minghao Xu[+], Hang Wang, Bingbing Ni, Hongyu Guo, **Jian Tang**. "Self-supervised Graph-level Representation Learning with Local and Global Structure", to appear at ICML'2021

[10] Sean Bin Yang[+], Chenjuan Guo, Jilin Hu, **JIan Tang**, Bin Yang. "Unsupervised Path Representation Learning with Curriculum Negative Sampling", IJCAI'2021

[11] Meng Qu[+], Junkun Chen[+], Louis-Pascal AC Xhonneux[+], Yoshua Bengio, **Jian Tang**. RNNLogic: Learning Logic Rules for Reasoning on Knowledge Graphs, ICLR'2021

[12] Minkai Xu[+], Shitong Luo[+], Yoshua Bengio, Jian Peng, **Jian Tang**. Learning Neural Generative Dynamics for Molecular Conformation Generation, ICLR'2021

[13] Yoshua Bengio, Prateek Gupta, Tegan Maharaj, Nasim Rahaman, Martin Weiss, Tristan Deleu, Eilif Benjamin Muller, Meng Qu, victor schmidt, Pierre-luc St-charles, hannah alsdurf, Olexa Bilaniuk, david buckeridge, gaetan caron, pierre luc carrier, Joumana Ghosn, satya ortiz gagne, Christopher Pal, Irina Rish, Bernhard Schlkopf, abhinav sharma, **Jian Tang**, andrew williams. Predicting Infectiousness for Proactive Contact Tracing, ICLR'2021

[14] Vikas Verma[+], Meng Qu[+], Alex Lamb, Yoshua Bengio, Juho Kannala, **Jian Tang**. GraphMix: Regularized Training of Graph Neural Networks for Semi-Supervised Learning, AAAI'2021

[15] Shengding Hu[+], Zheng Xiong[+], Meng Qu[+], Xingdi Yuan, Marc-Alexandre Ct, Zhiyuan Liu, **Jian Tang**. Graph Policy Network for Transferable Active Learning on Graphs, NeurIPS'2020

[16] Ashutosh Adhikari[+], Xingdi Yuan, Marc-Alexandre Ct, Mikul Zelinka, Marc-Antoine Rondeau, Romain Laroche, Pascal Poupart, **Jian Tang**, Adam Trischler, William L Hamilton. Learning dynamic knowledge graphs to generalize on text-based games, NeurIPS'2020

[17] Wangchunshu Zhou[+], Jinyi Hu[+], Hanlin Zhang[+], Xiaodan Liang, Maosong Sun, Chenyan Xiong, **Jian Tang**. Towards Interpretable Natural Language Understanding with Explanations as Latent Variables, NeurIPS'2020

[18] Chence Shi[+], Minkai Xu[+], Hongyu Guo, Ming Zhang, **Jian Tang**. A Graph to Graphs Framework for Retrosynthesis Prediction, ICML'2020

[19] Meng Qu[+], Tianyu Gao[+], Louis-Pascal AC Xhonneux[+], **Jian Tang**. Few-shot Relation Extraction via Bayesian Meta-learning on Task Graphs, ICML'2020

[20] Louis-Pascal AC Xhonneux[+], Meng Qu[+], **Jian Tang**. Continuous Graph Neural Networks, ICML'2020

[21] Sai Krishna Gottipati, Boris Sattarov, Sufeng Niu, Haoran Wei, Yashaswi Pathak, Shengchao Liu, Simon Blackburn, Karam Thomas, Connor Coley, **Jian Tang**, Sarath Chandar, Yoshua Bengio. Learning to Navigate in Synthetically Accessible Chemical Space Using Reinforcement Learning, ICML'2020

[22] Chence Shi[*+], Minkai Xu[*+], Zhaocheng Zhu[+], Weinan Zhang, Ming Zhang, **Jian Tang**. GraphAF: a Flow-based Autoregressive Model for Molecular Graph Generation. To appear at the International Conference on Learning Representations 2020 (ICLR'2020), Addis Ababa, Ethiopia, Apr.26-Apr. 30, 2020

[23] Fan-Yun Sun[+], Jordan Hoffmann[+], Vikas Verma[+], **Jian Tang**. InfoGraph: Unsupervised and Semi-supervised Graph-Level Representation Learning via Mutual Information Maximization. To appear at the International Conference on Learning Representations 2020 (ICLR'20, Spotlight), Addis Ababa, Ethiopia, Apr.26-Apr. 30, 2020

[24] Meng Qu[+], **Jian Tang**. Probabilistic Logic Neural Networks for Reasoning . In the Thirty-third Annual Conference on Neural Information Processing Systems, Vancouver Convention Center(NeurIPS'19), Vancouver Canada.

[25] Fan-Yun Sun[+], Meng Qu[+], Jordan Hoffmann[+], Chin-Wei Huang, **Jian Tang**. vGraph: A Generative Model for Joint Community Detection and Node Representation Learning. In the Thirty-third Annual Conference on Neural Information Processing Systems, Vancouver Convention Center(NeurIPS'19), Vancouver Canada.

[26] Meng Qu[+], Yoshua Bengio, and **Jian Tang**. GMNN: Graph Markov Neural Networks. In the 36th International Conference on Machine Learning (ICML'19), Long Beach, California, United States.

[27] Yanru Qu[+], Ting Bai[+], Weinan Zhang, Jianyun Nie, **Jian Tang**. An End-to-End Neighborhood-based Interaction Model for Knowledge-enhanced Recommendation. In the first Workshop on Deep Learning Practice for High-dimensional Space data, KDD 2019, Alaska, US. **(Best Paper Award)**

[28] Weiping Song[+], Chence Shi[+], Zhiping Xiao, Zhijian Duan[+], Yewen Xu, Ming Zhang, **Jian Tang**. AutoInt: Automatic Feature Interaction Learning via Self-Attentive Neural Networks. In CIKM'19.

[29] Shagun Sodhani[+], Anirudh Goyal, Tristan Deleu, Yoshua Bengio, Sergey Levine, **Jian Tang**. Learning Powerful Policies by Using Consistent Dynamics Model. In the Multi-disciplinary Conference on Reinforcement Learning and Decision Making (RLDM), Montreal, Canada, 2019.

[30] Andreea Deac[+], Yu-Hsiang Huang, Petar Velikovi, Pietro Li, **Jian Tang**. Drug-Drug Adverse Effect Prediction with Graph Co-Attention. In the workshop on Computational Biology at the 36th International Conference on Machine Learning (ICMLW'19).

[31] Cheng Yang[+], **Jian Tang**, Maosong Sun, Ganqu Cui, and Zhiyuan Liu.Multi-scale Information Diffusion Prediction with Reinforced Recurrent Networks. In the International Joint Conference on Artificial Intelligence (IJCAI'19), August 10-16 2019, Macao, China.

[32] Zhiqing Sun[+], **Jian Tang**, Pan Du, Zhi-Hong Deng and Jian-Yun Nie. DivGraphPointer: A Graph Pointer Network for Extracting Diverse Keyphrases. In the 42nd International ACM SIGIR Conference on Research and Development in Information Retrieval (SIGIR'19), July 21-25, 2019, Paris, France.

[33] Zhaocheng Zhu[+], Shizhen Xu, Meng Qu, **Jian Tang**. GraphVite: A High-Performance CPU-GPU Hybrid System for Node Embedding. In the Web Conference 2019 (formerly known as WWW'2019), San Francisco, CA, USA, May 13-17, 2019

[34] Zhiqing Sun[+], Zhi-Hong Deng, Jian-Yun Nie, **Jian Tang**. RotatE: Knowledge Graph Embedding by Relational Rotation in Complex Space. In the Seventh International Conference on Learning Representations (ICLR'19), New Orleans, USA.

[35] Pengfei Liu[+], Shuaichen Chang, Xuanjing Huang, **Jian Tang**, Jackie Chi Kit Cheung. Contextualized Non-local Neural Networks for Sequence Learning. In the Thirty-Third AAAI Conference on Artificial Intelligence (AAAI'19), Hawaii, USA, 2019.

[36] Weiping Song[+], Zhiping Xiao, Yifan Wang, Laurent Charlin, Ming Zhang and **Jian Tang**. Session-based Social Recommendation via Dynamic Graph Attention Networks. In the 12th ACM International Conference on Web Search and Data Mining (WSDM'19), Melbourne, Australia, February 11-15, 2019

[37] Jiezhong Qiu[+], **Jian Tang**, Hao Ma, Yuxiao Dong, Kuansan Wang, and Jie Tang. DeepInf: Modeling Influence Locality in Large Social Networks. In Proceedings of the Twenty-Fourth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD'18).

[38] Minjeong Kim[+], Minsuk Choi, Sunwoong Lee, **Jian Tang**, Haesun Park, and Jaegul Choo. PixelSNE: Pixel-Aligned Stochastic Neighbor Embedding for Efficient 2D Visualization with Screen-Resolution Precision. In 20th EG / VGTC Conference on Visualization (EuroVis'18).

[39] Quanyu Dai[+], Qiang Li, **Jian Tang**, and Dan Wang. Adversarial Network Embedding, in Proc. of 2018 AAAI Conf. on Artificial Intelligence (AAAI'18), New Orleans, LA, Feb. 2018.

[40] Luchen Liu[+], Jianhao Shen, Ming Zhang, Zichang Wang, and **Jian Tang**. Learning the Joint Representation of Heterogeneous Temporal Events for Clinical Event Prediction, in Proc. of 2018 AAAI Conf. on Artificial Intelligence (AAAI'18), New Orleans, LA, Feb. 2018.

[41] Meng Qu[+], **Jian Tang**, and Jiawei Han, Curriculum Learning for Heterogeneous Star Network Embedding via Deep Reinforcement Learning. In Proc. of 2018 ACM Int. Conf. on Web Search and Data Mining (WSDM'18), Los Angeles, CA, Feb. 2018.

[42] Meng Qu[+], **Jian Tang**, Jingbo Shang, Xiang Ren, Ming Zhang, Jiawei Han. An Attention-based Collaboration Framework for Multi-View Network Representation Learning, in Proc. of 2017 ACM Int. Conf. on Information and Knowledge Management (CIKM'17), Singapore, Nov. 2017.

[43] **Jian Tang**, Cheng Li and Qiaozhu Mei. Learning representations of large-scale networks. KDD'17 Tutorial.

[44] **Jian Tang**, Yue Wang, Kai Zheng, and Qiaozhu Mei. End-to-end learning for short text expansion. In KDD'17.

[45] Xuanzhe Liu, Wei Ai, Huoran Li, **Jian Tang**, Gang Huang, and Qiaozhu Mei, Derive user preferences of mobile apps from their management activities, in *ACM Transactions on Information Systems (TOIS)* , In press, 2016.

[46] **Jian Tang**, Jingzhou Liu, Ming Zhang, and Qiaozhu Mei. Visualizing large-scale and high-dimensional data. In *Proceedings of the 25th international conference on World wide web (**WWW'16**).* (**Best Paper Nomination, 5/727**)

[47] Huoran Li, Wei Ai, Xuanzhe Liu, **Jian Tang**, Gang Huang, Feng Feng, and Qiaozhu Mei, Voting with their feet: inferring user preferences from app management activities. In *Proceedings of the 25th international conference on World wide web (**WWW'16**) (industry track).*

[48] **Jian Tang**, Meng Qu and Qiaozhu Mei. PTE: Predictive text embedding through large-scale heterogeneous text networks. In *Proceedings of the 21st ACM SIGKDD international conference on knowledge discovery and data mining (**KDD'15**)*.

[49] **Jian Tang**, Meng Qu, Mingzhe Wang, Ming Zhang, Jun Yan, and Qiaozhu Mei. LINE: Large-scale information network embedding. In *Proceedings of the 24th international conference on World wide web (**WWW'15**)*. (**Most Cited Paper in WWW'15**)

[50] Yong Luo, **Jian Tang**, Jun Yan, Chao Xu, and Zheng Chen. Pre-trained multi-view word embedding using two-side neural network. In *Proceedings of the 28th AAAI conference on Artificial Intelligence (**AAAI'14**)*.

[51] **Jian Tang**, Zhaoshi Meng, Xuanlong Nguyen, Qiaozhu Mei and Ming Zhang. Understanding the limiting factors of topic modeling via posterior contraction analysis. In *Proceedings of the 31st international conference on machine learning (**ICML'14**)*. (**Best Paper Award**)

[52] **Jian Tang**, Ming Zhang, and Qiaozhu Mei. One theme in all views: Modeling consensus topics in multiple contexts. In *Proceedings of the 19th ACM SIGKDD international conference on knowledge discovery and data mining (**KDD'13**)*.

[53] **Jian Tang**, Jun Yan, Lei Ji, Ming Zhang, Shaodan Guo, Ning Liu, Xianfang Wang, and Zheng Chen. Collaborative users' brand preference across multiple domains from implicit feedbacks. In *Proceedings of the 25th AAAI conference on Artificial Intelligence (**AAAI'11**)*.

[54] **Jian Tang**, Ning Liu, Jun Yan, Yelong Shen, Shaodan Guo Bin Gao, Shuicheng Yan, and Ming Zhang. Learning to rank audience for behavioral targeting in display ads. In *Proceedings of the 20th ACM conference on information and knowledge management (**CIKM'11**)*.

[55] Lei Zhang, **Jian Tang**, and Ming Zhang. Integrating temporal usage pattern into personalized tag prediction. In *Proceedings of the 14th Asia-Pacific web conference (**APWEB'11**)*.

[56] Ming Zhang, Sheng Feng, **Jian Tang**, Bolanle Ojokoh, and Guojun Liu. Co-ranking multiple entities in a heterogeneous network: Integrating temporal factor and users' bookmarks. In *Proceedings of the 14th international conference on Asian digital libraries (**ICADL'11**)*.

[57] Bolanle Ojokoh, Ming Zhang, and **Jian Tang**. A trigram hidden Markov model for metadata extraction from heterogeneous references. *Information Science* , Volume 181, Issue 9, 1 May 2011, Pages 1538-1551.

[58] Fei Yan, Ming Zhang, **Jian Tang**, Tao Sun, Zhi-Hong Deng, and Long Xiao. Users' bookloan behaviors analysis and knowledge dependency mining. In *Proceedings of the 10th Web-age information management (**WAIM'10**)*.

[59] Yan Fei, Zhang Ming, Tan Yuwei, **Tang Jian**, and Deng Zhihong. Community discovery based on actors' interest and social network structure. In *Proceedings of the 27th National Database Conference of China (**NDBC'10**)*.

Preprint

[1] Andreea Deac[+], Pierre-Luc Bacon, **Jian Tang**. "Graph neural induction of value iteration.", arXiv:2009.12604.

[2] Simeon Spasov, Alessandro Di Stefano, Pietro Li, **Jian Tang**. "GRADE: Graph Dynamic Embedding.", arXiv:2007.08060.

[3] Hannah Alsdurf, Yoshua Bengio, Tristan Deleu, Prateek Gupta, Daphne Ippolito, Richard Janda, Max Jarvie, Tyler Kolody, Sekoul Krastev, Tegan Maharaj, Robert Obryk, Dan Pilat, Valerie Pisano, Benjamin Prud'homme, Meng Qu, Nasim Rahaman, Irina Rish, Jean-Franois Rousseau,

Abhinav Sharma, Brooke Struck, **Jian Tang**, Martin Weiss, Yun William Yu. "COVI White Paper.", arXiv:2005.08502.

[4] Jordan Hoffmann[+], Louis Maestrati, Yoshihide Sawada, **Jian Tang**, Jean Michel Sellier, Yoshua Bengio. Data-Driven Approach to Encoding and Decoding 3-D Crystal Structures , arXiv:1909.00949.

[5] Weiping Song[+], Zhijian Duan[+], Ziqing Yang, Hao Zhu, Ming Zhang, **Jian Tang**. Explainable Knowledge Graph-based Recommendation via Deep Reinforcement Learning. arXiv preprint arXiv:1906.09506, 2019

[6] Meng Qu[+], **Jian Tang**, Yoshua Bengio. Weakly-supervised Knowledge Graph Alignment with Adversarial Learning. arXiv preprint arXiv:1907.03179, 2019

[7] Mingjie Sun[+], **Jian Tang**, Huichen Li, Bo Li, Chaowei Xiao, Yao Chen, Dawn Song. Data Poisoning Attack against Unsupervised Node Embedding Methods. arXiv:1810.12881, 2018

[8] **Jian Tang**, Yifan Yang, Sam Carton, Ming Zhang, and Qiaozhu Mei. Context-aware natural language generation with recurrent neural networks. arXiv:1611.09900, 2016

[9] **Jian Tang**, Meng Qu, and Qiaozhu Mei. Identity-sensitive word embedding through heterogeneous networks. arXiv:1611.09878, 2016

[10] **Jian Tang**, Cheng Li, Ming Zhang, and Qiaozhu Mei. Less is More: Learning prominent and diverse topics for data summarization. arXiv:1611.09921, 2016

[11] **Jian Tang**, Ming Zhang, and Qiaozhu Mei. "Look Ma, No Hands!" A parameter-free topic model. arXiv:1409.2993, 2014.

TUTORIALS AND ORGANIZED WORKSHOPS

Tutorials

[1] **Jian Tang**, Fei Wang, Feixiong Cheng. "Artificial Intelligence for Drug Discovery". KDD'2021.

[2] **Jian Tang**, Fei Wang, Feixiong Cheng. "Artificial Intelligence for Drug Discovery". AAAI'2021.

[3] William L. Hamilton and **Jian Tang**. Graph Representation Learning. Tutorial at the Thirty-Third AAAI Conference on Artificial Intelligence (AAAI'19), Hawaii, USA, 2019.

[4] Jian Tang, Cheng Li and Qiaozhu Mei. "Learning representations of networks". Tutorial at KDD'17.

Organized Workshops

[1] Jian Tang, Le Song, Jure Leskovec, Renjie Liao, Yujia Li, Sanja Fidler, Richard Zemel, Ruslan Salakhutdinov. "Bridge Between Perception and Reasoning: Graph Neural Networks & Beyond", ICML 2020.

[2] Lingfei Wu, Jian Tang, Yinglong Xia, Charu Aggarwal. "The First International Workshop on Deep Learning on Graphs: Methodologies and Applications (DLGMA20)", AAAI 2020.

[3] Huawei Shen, Jian Tang, Peng Bao. "The first International Workshop on Graph Representation Learning and its Applications", CIKM 2019.

[4] Jian Tang, Shagun Sodhani, Will Hamiltion, Reihaneh Rabbany, Vincent Gripon. "Deep Learning for Graphs", SDM'19.

TEACHING EXPERIENCE

HEC Montréal, Montréal, QC   *2020 Winter*
"Deep Learning and Applications"

HEC Montréal, Montréal, QC   *2018 Fall and 2019 Winter*
Graduate course "Data Mining".

HEC Montréal, Montréal, QC   *2018 winter*
Undergraduate course "statistics".

Peking University, Beijing, China   *2018 summer*
Summer course "deep learning".

Peking University, Beijing, China   *2017 summer*
Summer course "deep learning".

Peking University, Beijing, China   *2015 summer*
Co-organizer for "Data mining camp".

Peking University, Beijing, China   *2010 summer*
Teaching Assistant for "Career Planning and Leadership Development."

PROFESSIONAL ACTIVITIES AND SERVICES

Conferences and Journals:

- *Area Chair*: AAAI'2022

- *Area Chair*: ICML'2021, NeurIPS'2021, AKBC'2021.

- *Program Committee member*: ICLR 2021, AAAI 2021, WWW 2021.

- *Reproducibility chair*: IJCAI 2021.

- *(Senior) Program Committee member*: ICLR 2020, NeurIPS 2020, (Senior) CIKM 2020 (Short paper track), WWW 2020, AAAI 2020.

- *Program Committee member*: ICLR 2019, AAAI 2019, WSDM 2019, WWW 2019, IJCAI 2019.

- *Program Committee member*: WSDM 2018, AAAI 2018, CAI 2018, WWW 2018, ICML 2018, IJCAI 2018, NIPS 2018, EMNLP 2018, CIKM 2018.

- *Program Committee member*: WWW 2017, AAAI 2017, EACL 2017, IJCAI 2017, KDD 2017, EMNLP 2017, CIKM 2017, BigData 2017, NLPCC 2017

- *Area Chair* of Machine learning and prediction in National Social Media Processing (SMP 2016)

- *Program Committee member*: WWW2016, ACL2016, IJCAI 2016, EMNLP 2016, ASONAM 2016, NLPCC 2016

- *Program Committee member*: WWW 2015, EMNLP 2015

- *Journal Reviewer*: Transactions on Knowledge and Data Engineering (TKDE), Transactions on the Web (TWeb), Transactions on Information Systems (TOIS), Transactions on Big Data (TBD), Journal of Machine Learning Research (JMLR), Pattern Analysis and Machine Intelligence (PAMI), Bioinformatics, Biomedicine Pharmacotherapy

Grant Review:

- NSF CRII, US

- NSERC Discovery Grant

- New Frontiers in Research Fund

- Microsoft-Mila Collaborative Grant

- IVADO Graduate Student Scholarship Committee

TALKS

[1] Invited talk on "Geometric Deep Learning for Drug Discovery" at ByteDance, August 2021.

[2] Guest lecture on "Logic Reasoning for Knowledge Graphs" at the advanced machine learning class offered by Jie Tang at Tsinghua University, May 2021.

[3] Guest lecture on "Graph Representation Learning for Drug Discovery" at Yale University, May 2021.

[4] Invited talk on "Graph Representation Learning for Drug Discovery" at the first workshop on "AI + Medicine" at Institute for AI Industry Research, Tsinghua University, April 2021.

[5] Invited Talk on "Graph Representation Learning for Drug Discovery" at the research seminar of the School of Biomedical Informatics, University of Texas, March 2021.

[6] Keynote Talk "Learning Symbolic Logic Rules for Reasoning on Knowledge Graphs" at the International Workshop on Deep Learning on Graphs in AAAI'2021, February, 2021.

[7] AAAI'21 Tutorial "Artificial Intelligence for Drug Discovery" with Fei Wang and Feixiong Cheng, February, 2021.

[8] Invited Talk "Graph Representation Learning for Drug Discovery", Seminar Series on Trustworthy Data Science and AI at Simon Fraser University, December, 2020.

[9] Invited Tutorial "Neural and Symbolic Logical Reasoning on Knowledge Graphs", at the Summer School of Chinese Information Processing Society of China (CIPS), November, 2020.

[10] Invited Talk "Deep Generative Models for Molecular Conformation Generation", at the AI Cures Drug Discovery Conference. October, 2020.

[11] Invited Talk "Graph Representation Learning for Drug Discovery", Mila/WeBank/DiDi Webinar, October, 2020.

[12] Invited Talk "Graph Representation Learning and Applications to Drug Discovery", at the McGill Seminar Series in Quantitative Life Sciences and Medicine, October, 2020.

[13] Invited Talk "Towards combining System I and System II Reasoning" at the Workshop on "Graph Neural Networks" in the second annual conference of Beijing Academy of Artificial Intelligence, June, 2020.

[14] Guest Lecture "Logical Reasoning with Graph Neural Networks", Tsinghua, 2020.

[15] Mila tea talk "Graph Representation Learning: Algorithms and Applications" May, 2020

[16] Invited Talk "Reasoning ", Mila-Industrial NLP Workshop, Feb, 2020.

[17] Guest Lecture "Graph Representation Learning and Applications", Mcgill University, November, 2019

[18] Guest Lecture "Graph Representation Learning and Applications", University of Montreal, November, 2019

[19] Invited Talk "Graph Representation Learning and Applications" at National Research Council Canada, 13rd, November, 2019

[20] Invited Talk "Graph Representation Learning and Applications to Drug Discovery", Midi Recherche, HEC Montreal, 6th, November, 2019.

[21] Invited Talk "Graph Representation Learning and Applications to Drug Discovery" at the Clinical Research Association of Canada, 29th, October, 2019.

[22] Invited Talk Towards Combining Statistical Relational Learning and Graph Neural Networks for Reasoning at the Deep Learning Summit, Montreal, 24th, October, 2019.

[23] Talk Towards Combining Statistical Relational Learning and Graph Neural Networks for Reasoning at the annual Mila-Microsoft Workshop. 16th, October, 2019.

[24] Invited Talk Graph Representation Learning and Applications to Drug Discovery at the first annual conference of Canada Chapter of Chinese Biopharmaceutical Association, 5th, October, 2019

[25] Invited Talk Towards Combining Statistical Relational Learning and Graph Neural Networks at IBM New York, August, 2019.

[26] Talk Graph Representation Learning and Reasoning at Peking University, Tsinghua University, Shanghai Jiaotong University, University of Science and Technology, July, 2019.

[27] Keynote Speaker: Graph Representation Learning: Algorithms, Applications, Systems at the invitation-only AI Experts Workshop in AI for Good Global Summit, Geneva, Swithland.

[28] Invited Speaker: GMNN: Graph Markov Neural Networks at IPAM Workshop Deep Geometric Learning of Big Data and Applications, UCLA, United States, 2019.5 video, slides

[29] Talk Graph Representation Learning: Algorithms, Applications, Systems in Computer Science Department at UCLA, United States, 2019.5

[30] Talk Knowledge graph embedding and alignment, Mila-Samsung Workshop, 2019.5, slides

[31] Talk Graph Representation Learning: Algorithms, Applications, Systems in the Statistics Department at McGill University, 2019.4

[32] Talk Graph Representation Learning and Applications in Healthcare and Biomedical Applications Faculty Seminar on AI and healthcare at McGill University, 2019.4.

[33] Talk RotatE: Knowledge Graph Embedding by Relational Rotation in Complex Space at Peking Univeristy,2019.1.

[34] Talk RotatE: Knowledge Graph Embedding by Relational Rotation in Complex Space at Huawei inhouse workshop,2018.12.

[35] Talk Graph representation learning and applications at Universit du Qubec Montral. 2018.11

[36] Talk Graph Representation Learning for Natural Language Understanding and Reasoning, Natural Language Processing Workshop for MILA Sponsors and Partners. 2018. 9

[37] Talk: "Graph representation learning and applications", Tsinghua University, 2018.7.

[38] Talk: Learning Representations of Graphs at Google Brain, Montreal, 2018.05.07.

[39] Invited talk: Progress and Future Directions of Network Representations at Machine Intelligence Frontier Seminar 2017, CCF special topic on knowledge graph, 2017.10

[40] Invited talk: Towards combining information retrieval and reasoning for natural language understanding, at Tsinghua University, 2017.9.

[41] Tutorial: Learning representations of large-scale networks at KDD 2017, Halifax, Canada, 2017.8

[42] Talk: Introduction to Deep Learning & How to Do Research in Machine Learning, at Peking University, 2017.6

[43] Talk: Visualizing large-scale and high-dimensional data, at PKU-UCLA Symposium. 2017. 7

[44] Talk: Learning representations of large-scale networks, at Peking University, Tsinghua University, JingDong, iFlytek, TianYanCha, Toutiao AI Lab, 2017.6-7.

[45] Talk: Learning representations of large-scale networks, at HEC Montreal.

[46] Talk: Learning representations of large-scale networks, at University of Montreal.

[47] Invited Talk: "Large-scale Information Network Embedding and Visualization" at Baidu, 2016.

[48] Invited Talk: "Learning Graph Representations and Visualization" at School of Information, Central University of Finance and Economics, 2016.

[49] Invited Talk: "Visualizing Large-scale and High-dimensional Data" at MOE-Microsoft Key Laboratory of Statistics and Information Technology of Peking University, 2016.

[50] Invited Talk: "Learning Text Embedding via Network Embedding" at 9th National R Meeting, 2016.

[51] Invited Talk: "Introduction to Deep Learning" at Peking University, 2016.

[52] Seminal Talk: "Attention, Memory, and Reasoning" at Microsoft Research Asia, 2016.

[53] Invited Talk: "Study on the Limiting Factors of Topic Modeling" at the China National Computer Congress (CNCC), 2015.

[54] Invited Talk: "LINE: Large-scale Information Network Embedding" at Beijing Institute of Technology, Alibaba Technical Forum, 2015.

[55] Invited Talk: "Look Ma, No hands! A Parameter-free Topic Model" at student seminar of statistics department in University of Michigan, 2013

[56] Invited Talk: "Look Ma, No hands! A Parameter-free Topic Model" at the 4th Michigan data mining workshop, 2013.

[57] Seminar Talks at Microsoft Research Asia, 2014, 2015, 2016.

STUDENT SUPERVISION

PhD

[1] Zhaocheng Zhu, 2018.9-

[2] Meng Qu, 2019.1-

[3] Andreea Deac, 2019.9-

[4] Louis-Pascal Xhonneux, 2019.9-

[5] Shengchao Liu, 2020.1-

[6] Chengce Shi, 2020.9-

[7] Huiyu Cai, 2021.9-

[8] Farzaneh Heidara, 2021.9-

[9] Zuobai Zhang, 2021.9-

MSc

[1] Minkai Xu, 2020.9-

[2] Jairui Lu, 2021.9-

Current Interns

[1] Haoxiang Yang (Undergraduate, Peking University, summer 2021)

[2] Chang Ma (Undergraduate, Peking University, summer 2021)

[3] Yangtian Zhang (Undergraduate, Shanghai Jiaotong University, summer 2021)

Alumni

[1] Junkun Chen (Undergradaute, Tsinghua University), 2020.3-2020.10

[2] Zuobai Zhang (Undergradaute, Fudan University), summer 2020

[3] Minghao Xu (Master, Shanghai Jiao Tong University), summer 2020

[4] Huiyu Cai (Undergradaute, Peking University), summer 2020

[5] Shuangrui Ding (Undergradaute, University of Michigan), summer 2020

[6] Wangchunshu Zhou (Master, Beihang University), summer 2020

[7] Jinyi Hu (Undergraduate, Tsinghua University), summer 2020

[8] Hanlin Zhang (Undergraduate, South China University of Technology), summer 2020

[9] Shitong Luo (Undergraduate, Peking University), summer 2020

[10] Hengyi Wang (Undergraduate, Peking University), summer 2020

[11] Hangrui Bi(Undergraduate, Peking University), summer 2020

[12] Zheng Xiong (Master, Tsinghua University), 2020.1-2020.4)

[13] Jordan Hoffmann (5th year Ph.D., Harvard University), summer, 2019.

[14] Tianyu Gao(Undergraduate, Tsinghua University), summer, 2019

[15] Shengding Hu(Undergraduate, Tsinghua University), summer, 2019

[16] Xiaozhi Wang(Undergraduate, Tsinghua University), summer, 2019

[17] Chence Shi(Undergraduate, Peking University), summer, 2019

[18] Zhijian Duan(Undergraduate, Peking University), summer, 2019

[19] Minkai Xu (Undergraduate, Shanghai JiaoTong University), summer, 2019

[20] Ledian Liu(Undergraduate, Shanghai JiaoTong University), summer, 2019

[21] Carlos Eduardo (Ph.D., IMT Atlantique), 2018.10-2019.9

[22] Weiping Song (Ph.D., Peking University), 2018.10-2019.9

[23] Fan-Yun Sun (Undergraduate, National Taiwan University), 2018.12-2019.5

[24] Sahith Dambekodi (Undergraduate, BITS Pilani), 2019.1- 2019.5

[25] Cheng Yang (Ph.D., Tsinghua University), 2018.6-2018.10

[26] Andreea-Ioana Deac (Undergraduate, University of Cambridge), summer, 2018

[27] Zhiqing Sun (Undergraduate, Peking University), summer, 2018

[28] Yizhou Zhang (Undergraduate, Peking University), summer, 2018

[29] Zilong Guo (Undergraduate, Shanghai JiaoTong University), summer, 2018

[30] Yanru Qu (M.Sc., Shanghai JiaoTong University), 2018.7- 2018.11

[31] Yash Agrawal (Undergradaute, IIT Kharagpur), 2018.10- 2019.1

[32] Shagun Sodhani, Co-supervised with Yoshua Bengio, 2017.9-2019.9.

SOFTWARE

[1] **TorchDrug**[1]: a machine learning platform designed for drug discovery, covering techniques from graph machine learning (graph neural networks, geometric deep learning knowledge graphs), deep generative models to reinforcement learning. It provides a comprehensive and flexible interface to support rapid prototyping of drug discovery models in PyTorch (https://torchdrug.ai/). Released at Github since 2021.8, with over **420** stars.

[2] **GraphVite**[2]: a scalable and high-performance graph embedding system developed from scratch covering three different types of applications including node embedding, knowledge graph embedding, and graph and high-dimensional data visualization (https://graphvite.io/). Released at Github since 2019.8, with over **940** stars.

[3] **Recommender Systems**[3]: a Tensorflow library of deep learning for recommender systems including sequential recommendation, feature-based recommendation and social recommendation. Released at Github since 2019.3, with over **800** stars.

[4] **Knowledge Graph Embedding**[4]: a PyTorch implementation of the RotatE model for knowledge graph embedding (KGE). We provide a toolkit that gives state-of-the-art performance of several popular KGE models. Released at Github since 2019.1, with over **750** stars.

[5] **LargeVis**[5]: a very efficient algorithm for visualizing large-scale and high-dimensional data. Released at Github since 2016.7, with over **500** stars.

[6] **LINE**[6]: a very efficient algorithm for embedding large-scale networks. Released at Github since 2015.3, with over **800** stars.

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[1] https://github.com/DeepGraphLearning/torchdrug/
[2] https://github.com/DeepGraphLearning/graphvite
[3] https://github.com/DeepGraphLearning/RecommenderSystems
[4] https://github.com/DeepGraphLearning/KnowledgeGraphEmbedding
[5] https://github.com/lferry007/LargeVis
[6] https://github.com/tangjianpku/LINE