Deng Yanchen

+65 81194961 ycdeng@ntu.edu.sg
N4-B1A-02, Nanyang Technological University, Nanyang Avenue Singapore 639798

Education Backgrounds

Nanyang Technological University *August 2020-Present*
Ph.D. candidate (Computer Science)
- Supervisor: Prof. Bo An

Chongqing University *September 2015-July 2018*
Master (Computer Science)
- Supervisor: Lec. Ziyu Chen
- Thesis: *Study on Inference-based Algorithms for Distributed Constraint Optimization Problems* (**Winner of Outstanding Thesis of Chongqing Municipality**)

Fujian Normal University *September 2011-July 2015*
Bachelor (Electronic Information Science)

Research Interests

Multi-agent systems; Cooperation & coordination; Distributed problem solving; Constraint reasoning; Graphical model; Machine learning for combinatorial optimization

Employment History

Nanyang Technological University *August 2018-Present*
Research Associate

Internship

Cainiao Smart Logistics Network Limited *October 2018-September 2019*
Research Intern - Optimizations for Automated Warehouses
- Proposed a novel deep reinforcement learning (DRL) algorithm for solving battery management problems in a large-scale automated warehouse with more than 700 battery-powered robots.
- Reduced the average makespan by 6.2%.

Selected Publications

* for corresponding author, # for co-first author

[1] **Yanchen Deng**, Shufeng Kong, Caihua Liu, Bo An. Deep attentive belief propagation: Integrating reasoning and learning for solving constraint optimization problems. Proceedings of the Thirty-sixth Annual Conference on Neural Information Processing Systems (**NeurIPS'22**), accepted, 2022. (acceptance rate: 25.6%, **CCF-A**)

[2] Chen Dingding, Ziyu Chen, **Yanchen Deng**, Zhongshi He, Lulu Wang. Inference-based complete algorithms for asymmetric distributed constraint optimization problems. Artificial Intelligence Review, accepted, 2022. (**SCI, IF=9.588**; Extended journal version of conference paper [11])

[3] **Yanchen Deng**, Shufeng Kong, Bo An. Pretrained cost model for distributed constraint optimization problems. Proceedings of the 36th AAAI Conference on Artificial Intelligence (**AAAI'22**), pp.9331-9340. 2022. (acceptance rate: 15.0%, **CCF-A**)

[4] **Yanchen Deng**, Bo An. Utility distribution matters: Enabling fast belief propagation for multi-agent optimization with dense local utility function. Journal of Autonomous Agents and Multi-Agent Systems, Vol.35, No.2, Article 24, 2021. (**SCI, CCF-B**)

[5] **Yanchen Deng**, Runsheng Yu, Xinrun Wang, Bo An. Neural regret matching for distributed constraint optimization problems. Proceedings of the 30th International Joint Conference on Artificial Intelligence (**IJCAI'21**), pp.146-153. 2021. (acceptance rate: 13.9%, **CCF-A**)

[6] **Yanchen Deng**, Bo An. Speeding up incomplete GDL-based algorithms for multi-agent optimization with dense local utilities. Proceedings of the 29th International Joint Conference on Artificial Intelligence (**IJCAI'20**), pp.31-38. 2020. (acceptance rate: 12.6%, **CCF-A**; Invited to JAAMAS fast-track publication)

[7] **Yanchen Deng**, Bo An, Zongmin Qiu, Liuxi Li, Yong Wang, Yinghui Xu. Battery Management for Automated Warehouses via Deep Reinforcement Learning. Proceedings of the 2nd International Conference on Distributed Artificial Intelligence (**DAI'20**), pp.126-139. 2020. (acceptance rate: 39.1%)

[8] Dingding Chen[#], **Yanchen Deng**[#], Ziyu Chen, Zhongshi He, Wenxin Zhang. A hybrid tree-based algorithm to solve asymmetric distributed constraint optimization problems. Journal of Autonomous Agents and Multi-Agent Systems, Vol.34, Article 50. 2020. (**SCI, CCF-B**)

[9] Dingding Chen, **Yanchen Deng**, Ziyu Chen, Wenxing Zhang, Zhongshi He. HS-CAI: A hybrid DCOP algorithm via combining search with context-based inference. Proceedings of the 34th AAAI Conference on Artificial Intelligence (**AAAI'20**), pp.7087-7094. 2020. (acceptance rate: 20.6%, **CCF-A**)

[10] Ziyu Chen, Wenxin Zhang, **Yanchen Deng**[*], Dingding Chen, Qing Li. RMB-DPOP: Refining MB-DPOP by reducing redundant inferences. Proceedings of the 19th International Conference on Autonomous Agents and Multiagent Systems (**AAMAS'20**), pp.249-257. 2020. (acceptance rate: 23.0%, **CCF-B**)

[11] **Yanchen Deng**, Ziyu Chen, Dingding Chen, Wenxin Zhang, Xingqiong Jiang. AsymDPOP: Complete inference for asymmetric distributed constraint optimization problems. Proceedings of the 28th International Joint Conference on Artificial Intelligence (**IJCAI'19**), pp.223-230. 2019. (acceptance rate: 17.9%, **CCF-A**)

[12] Ziyu Chen, Xingqiong Jiang, **Yanchen Deng**[*], Dingding Chen, Zhongshi He. A generic approach to accelerating belief propagation based incomplete algorithms for DCOPs via a branch-and-bound technique. Proceedings of the 33rd AAAI Conference on Artificial Intelligence (**AAAI'19**), pp.6038-6045. 2019. (acceptance rate: 16.2%, **CCF-A**)

[13] **Yanchen Deng**, Ziyu Chen, Dingding Chen, Xingqiong Jiang, Qiang Li. PT-ISABB: A hybrid tree-based complete algorithm to solve asymmetric distributed constraint optimization problems. Proceedings of the 18th International Conference on Autonomous Agents and Multiagent Systems (**AAMAS'19**), pp.1506-1514. 2019. (acceptance rate: 24.0%, **CCF-B**; Invited to JAAMAS fast-track publication)

[14] Ziyu Chen[*], **Yanchen Deng**[*], Tengfei Wu, Zhongshi He. A class of iterative refined Max-sum algorithms via non-consecutive value propagation strategies. Journal of Autonomous Agents and Multiagent Systems, 32(6): 822-860. 2018. (**SCI, CCF-B**)

[15] Ziyu Chen, Tengfei Wu, **Yanchen Deng**, Cheng Zhang. An ant-based algorithm to solve distributed constraint optimization problems. Proceedings of the 32nd AAAI Conference on Artificial Intelligence (**AAAI'18**), pp.4654-4661. 2018. (acceptance rate: 24.6%, **CCF-A**)

[16] Ziyu Chen, **Yanchen Deng**, Tengfei Wu. An iterative refined Max-sum_AD algorithm via single-side value propagation and local search. Proceedings of the 16th International Conference on Autonomous Agents and Multiagent Systems (**AAMAS'17**), pp.195-202. 2017. (acceptance rate: 27.3%, **CCF-B**)

[17] Zhepeng Yu, Ziyu Chen, Jingyuan He, **Yanchen Deng**. A partial decision scheme for local search algorithms for distributed constraint optimization problems. Proceedings of the 16th International Conference on Autonomous Agents and Multiagent Systems (**AAMAS'17**), pp.187-194. 2017. (acceptance rate: 27.3%, **CCF-B**)

Honors and Awards

- *Outstanding Thesis* of Chongqing Municipality (2019, awarded by Chongqing Education Commission).
- *Second Prize* of HUAWEI Cup - The Contest of Intelligence Design for Chinese Undergraduates (2015).
- *Motivational Pioneer* of Fujian (2015, awarded by Department of Education of Fujian Province).
- *Outstanding Thesis* of Fujian Normal University (2015).
- *Excellent Graduate* of Fujian Normal University (2015).
- *Weixin Wu Scholarship* of Fujian Normal University (2013).

Professional Services

- Program Committee Member
  - AAAI Conference on Artificial Intelligence
    - AAAI'21 (Top 25% PC Member Award); AAAI'22; AAAI'23
  - International Joint Conference on Artificial Intelligence
    - IJCAI'23
- Reviewer
  - PeerJ Computer Science

References

- Prof. Bo An <boan@ntu.edu.sg>
  - School of Computer Science and Engineering, Nanyang Technological University
- Prof. Zhongshi He <zshe@cqu.edu.cn>
  - College of Computer Science, Chongqing University
- Assoc. Prof. Shufeng Kong <kongshf@mail.sysu.edu.cn>
  - School of Software Engineering, Sun Yat-sen University
- Lec. Ziyu Chen <chenziyu@cqu.edu.cn>
  - College of Computer Science, Chongqing University