

## 基本信息

姓名 孙亚辉  
微信 quick123456  
电话 +65 90306992  
网址 <https://yahuisun.com>  
邮箱 yahui.sun@ntu.edu.sg  
语言 普通话, 英语, C++, R, MATLAB  
现在的职位 研究员 (Research fellow), School of Computer Science and Engineering, 南洋理工大学 (Nanyang Technological University)



## 教育与工作经历

2019- 研究员 (Research fellow), 南洋理工大学 (Nanyang Technological University, Singapore)  
2018-2019 博士后 (Postdoctoral fellow), 澳大利亚国立大学 (Australian National University, Australia)  
2014-2018 博士 (工程学院), 澳大利亚墨尔本大学 (University of Melbourne, Australia)  
论文题目: Classical, prize-collecting and node-weighted Steiner tree problems in graphs  
2012-2014 硕士 (航天工程), 哈尔滨工业大学, 哈尔滨 (Harbin Institute of Technology, Harbin)  
2008-2012 本科 (飞行器设计与工程), 哈尔滨工业大学, 哈尔滨 (Harbin Institute of Technology, Harbin)

## 研究方向

- 图挖掘 (graph mining)  $\subset$  数据挖掘 (data mining) (知识图谱、社交网络、智慧城市等)
- 网络 (networking) (计算机网络、物联网、智慧城市等)

## 职业概述

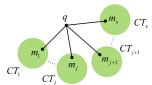
激励于2003年的神舟五号载人航天工程, 我在哈尔滨工业大学攻读飞行器设计与工程专业的本科学位, 与航天工程专业的硕士学位。随后, 我在澳大利亚墨尔本大学攻读工程学院的博士学位, 研究方向为图论中的Steiner tree优化问题。我现在的研究方向, 也就是图计算与图挖掘, 源自我博士期间的研究工作。

## 代表作

**Yahui Sun**, Marcus Brazil, Doreen Thomas, and Saman Halgamuge. "The Fast Heuristic Algorithms and Post-Processing Techniques to Design Large and Low-Cost Communication Networks." **IEEE/ACM Transactions on Networking** (2019) (计算机网络领域顶刊; CCF A类).

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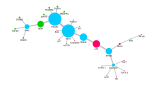
We propose two fast algorithms for the Prize-Collecting Steiner Tree Problem: the first one is a quasilinear-time heuristic algorithm that is faster and consumes less memory than the other algorithms; and the second one is an improvement of a state-of-the-art polynomial-time approximation algorithm that can produce near-optimal solutions at a speed that is only inferior to the first one. We demonstrate the competitiveness of our algorithms by comparing them with the state-of-the-art ones in large graphs with up to 1,000,000 vertices and 10,000,000 edges. We also propose some post-processing techniques to update the best-known solution for a notoriously difficult benchmark instance.



**Yahui Sun**, Chenkai Ma, and Saman Halgamuge. "The node-weighted Steiner tree approach to identify elements of cancer-related signaling pathways." **International Conference on Bioinformatics** (published in BMC Bioinformatics) (2017).

[PDF]

We propose the node-weighted Steiner tree approach to identifying important elements of cancer-related signaling pathways at the level of proteins. We apply this approach to identify important elements of two well-known cancer-related signaling pathways: PI3K/Akt and MAPK. On a commonly used personal computer, this new approach takes less than 2s to identify the important elements of PI3K/Akt and MAPK signaling pathways in a large node-weighted protein-protein interaction network with 16,843 vertices and 1,736,922 edges.



## 其他发表文章

**Yahui Sun**, and Saman Halgamuge. "Minimum-cost heterogeneous node placement in wireless sensor networks." IEEE Access (2019).  
[PDF]

**Yahui Sun**, Pathima Nusrath Hameed, Karin Verspoor, and Saman Halgamuge. "A physarum-inspired prize-collecting steiner tree approach to identify subnetworks for drug repositioning." International Conference on Bioinformatics (published in BMC Systems Biology) (2016).  
[PDF]

**Yahui Sun**, and Saman Halgamuge. "Fast algorithms inspired by physarum polycephalum for node weighted steiner tree problem with multiple terminals." In 2016 IEEE Congress on Evolutionary Computation (CEC), pp. 3254-3260. IEEE, (2016).  
[PDF]

**Yahui Sun**, Yunhai Geng, and Shuang Wang. "Analysis and calibration of star sensor's image plane displacement." Infrared and Laser Engineering 10 (2014): 26.  
[PDF]

**Yahui Sun**, Yingying Xiao, and Yunhai Geng. "On-orbit calibration of star sensor based on a new lens distortion model." In Proceedings of the 32nd Chinese Control Conference, pp. 4989-4994. IEEE, (2013).  
[PDF]

## 在审文章

Yahui Sun, Daniel Rehfeldt, Marcus Brazil, Doreen Thomas, and Saman Halgamuge. "A Physarum-inspired algorithm for minimum-cost relay node placement in wireless sensor networks", IEEE/ACM Transactions on Networking, (submitted in 03/2018; under the third round of review)

## 所获奖项

2014-2018	Melbourne International Research Scholarship, University of Melbourne, Australia (墨尔本大学全奖)
2014-2018	Melbourne International Fee Remission Scholarship, University of Melbourne, Australia (墨尔本大学全奖)
2013	National Scholarship, China (中国国家奖学金)
2008-2014	First-level Scholarship (multiple), Harbin Institute of Technology, China (哈尔滨工业大学奖学金)

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