

刘浩

博士研究生 · 数据工程师

浙江省杭州市浙江大学玉泉校区教九 525

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“当你启程前往伊萨卡，但愿你的道路漫长，充满奇迹，充满发现。”

教育经历

浙江大学控制科学与工程学院

博士，控制科学与工程

中国杭州

2012.09 - 2017.06(预计)

导师：孙优贤院士，陈积明教授（长江学者）

波士顿大学信息系统与工程研究中心

美国波士顿

访问学生，系统工程系

2015.03 - 2016.03

导师：Ioannis Ch. Paschalidis (IEEE Fellow)

南开大学信息技术科学学院

中国天津

学士，自动化

2008.09 - 2012.06

导师：方勇纯教授

技能和语言

编程语言 Python, C/C++, MATLAB, JAVA, LaTeX, VHDL

操作系统 Linux, OS X, Windows

外语水平 六级-568, 四级-608

研究兴趣

- 机器学习，网络优化，多机器人协同，分布式计算

项目经历

工业控制技术国家重点实验室

中国杭州

研究助理

2012.09 - 2017.06(预计)

- 设计了一种大数据的分布式隐私保护的选择算法。
- 设计了一种自组织网络的分布式中位数估计算法。
- 分布式评估自组织网络一致性协议中的节点重要性。
- 分布式网络中的差分隐私保护。
- 大规模地理位置隔离数据的分布式机器学习算法。

北京智诚智达交通科技有限公司

中国北京

“以下队伍均未获奖” 队队长

2016.11 - 2016.12

- 设计并实现了基于动态规划的北京市浮动车数据地图匹配算法。
- 可视化了浮动车行驶路径，地图匹配达到了 89% 的精度。
- 比赛最终评估中排名第 2。

波士顿大学信息系统与工程研究中心

美国波士顿

访问学生-项目“从飞行专家学习复杂区域的导航策略”

2015.03 - 2016.03

- 利用监督学习（逻辑回归）从小飞蛾飞行数据中获取了粗略飞行策略。
- 以粗略飞行策略作为初始迭代，利用强化学习提纯了飞行策略。
- 实现了算法原型并评估了学习到的飞行策略的性能。

工业控制技术国家重点实验室

开发-机器人路径规划展示系统

中国杭州

2012.07 - 2014.01

- 利用 iSpace 实现了机器人路径规划算法。
- 设计实现了机器人实时状态信息的可视化系统。
- 展示系统被 2014 年 ACM International Symposium on Mobile Ad Hoc Networking and Computing 会议接收。

浙江大学-北卡罗来纳州立大学联合项目

开发维护智能交通 iSPACE 演示系统

中国杭州

2012.07 - 2014.01

- 实现了基于 optitrack 摄像头-蓝牙-工作站的室内定位系统。
- 实现了系统信息的实时显示系统。
- 设计并测试了多种多机器人路径跟踪控制算法。
- 在 iSpace 上设计并测试了多机器人编队控制算法。

南开大学本科百项工程创新计划

算法设计-基于 FPGA 的正弦超声信号发生器

中国天津

2010.03 - 2011.09

- 基于 FPGA 实现了正弦超声波信号发生电路。
- 设计并实现了配置正弦波频率与幅值调节的算法。

荣誉 & 获奖

校外

2016 银牌(第 2 名), 2016 星际迷航高精度车辆追踪算法大赛

北京智诚智达交
通科技有限公司

校内

2015 获奖(前 10%), 优秀研究生

浙江大学

2015 获奖(前 5%), 林广兆 & 胡国赞研究生教育国际交流基金

浙江大学教育基
金会

2015 获奖(前 5%), 四方电器奖学金

浙江大学

2014 获奖(前 20%), 优秀博士生奖学金

浙江大学

2011 获奖(总成绩第 2 名), 国家励志奖学金

南开大学

2010 获奖(总成绩第 3 名), 优秀学生一等奖学金

南开大学

2009 获奖(总成绩第 3 名), 优秀学生一等奖学金

南开大学

兴趣爱好

- 跑步, 骑行, 游泳, 徒步, 阅读

发表文章

- [C1] Hao Liu, Xianghui Cao, Jianping He, Peng Cheng, Jiming Chen, Youxian Sun. Distributed identification of most critical node(s) for average consensus. *Proceedings of IFAC World Congress 2014*, Cape Town, South Africa, Aug. 24-29, 2014.
- [C2] Lingkun Fu, Hao Liu, Liang He, Yu Gu, Peng Cheng, Jiming Chen. Demo: An energy synchronized charging protocol for rechargeable wireless sensor networks. *ACM Mobihoc 2014*, Philadelphia, PA, USA, August 11-14, 2014.
- [C3] Manjesh K. Hanawal, Hao Liu, Henghui Zhu, Yannis Ch. Paschalidis. Learning Parameterized Policies for Markov Decision Processes through Demonstrations. *IEEE Conference on Decision and Control 2016*, Las Vegas, NV, USA, Dec. 12-14, 2016.
- [J1] Hao Liu, Xianghui Cao, Jianping He, Peng Cheng, Chunguang Li, Jiming Chen, Youxian Sun et al. Distributed identification of the most critical node for average consensus. *IEEE Transactions on Signal Processing*, vol. 63, no. 16, pp. 4315-4328, Aug. 2015.
- [J2] Henghui Zhu, Hao Liu, Armin Ataei, Jing Wang, Yannis Ch. Paschalidis. Learning from Animal "Experts" How to Navigate Complex Terrains. submitted to *PLOS one*.
- [J3] Hao Liu et al. Distributed privacy-aware fast selection algorithm for large-scale data, submitted to *IEEE Transactions on Parallel and Distributed Systems*.
- [J4] Manjesh K. Hanawal, Hao Liu, Henghui Zhu, Yannis Ch. Paschalidis. Learning Policies for Markov Decision Processes from Data, submitted to *IEEE Transactions on Automatic Control*.

Hao Liu

PH.D CANDIDATE · DATA ENGINEER

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“As you set out for Ithaca, hope your road is a long one, full of adventure, full of discovery.”

Education

College of Control Science and Engineering, Zhejiang University

Hangzhou, China

PH.D IN CONTROL SCIENCE AND ENGINEERING

Sep. 2012 - Jun. 2017(expected)

Co-supervised by Prof. Youxian Sun (Academician of the Chinese Academy of Engineering) and Prof. Jiming Chen (Changjiang Scholar Professor)

Center of Information Systems and Engineering, Boston University

Boston, USA

VISITING STUDENT IN SYSTEMS ENGINEERING

Mar. 2015 - Mar. 2016

Supervised by Prof. Ioannis Ch. Paschalidis (IEEE Fellow)

College of Information Technology and Science, Nankai University

Tianjin, China

B.S. IN AUTOMATION

Sep. 2008 - Jun. 2012

Supervised by Prof. Yongchun Fang

Skills

Programming Python, C/C++, MATLAB, JAVA, LaTeX, VHDL

Operation systems Linux, OS X, Windows

Languages English (CET6-568, CET4-608), Chinese

Research Interests

- machine Learning, network optimization, multi-robot coordination, distributed computation

Project Experience

State Key Laboratory of Industrial Control Technology

Hangzhou, China

RESEARCH ASSISTANT

Sep. 2012 - Exp. Jun. 2017

- Designed a distributed privacy-aware selection algorithm for big data.
- Designed a distributed median consensus algorithm in ad hoc networks.
- Distributed node importance ranking in ad hoc networks.
- Differential privacy in distributed networks.
- Distributed machine learning for large-scale geo-distributed data.

Beijing Bestrans Traffic Technology Co. Ltd.

Beijing, China

LEADER OF A COMPETITION TEAM

Nov. 2016 - Dec. 2016

- Designed a dynamic programming based map matching algorithm for floating car data in Beijing city.
- Visualize the dynamic path and arrived a precision of 89%.
- Won the Silver prize (2nd place) in final evaluation.

Center for Information Systems and Engineering, Boston University

Boston, USA

VISITING RESEARCHER FOR <LEARNING FROM ANIMAL “EXPERTS” HOW TO NAVIGATE COMPLEX TERRAINS>

Mar. 2015 - Mar. 2016

- Learned flight strategy of moth from its flight data via supervised learning.
- Used reinforcement learning to refine the strategy from supervised learning.
- Implemented the algorithm prototype and evaluated the performance of the learned policy.

State Key Laboratory of Industrial Control Technology

DEVELOPER OF A ROBOT SCHEDULING DEMONSTRATION SYSTEM

- Implemented a robot scheduling algorithm via the iSpace system.
- Visualized the real-time robot state information in the client computer.
- Demo accepted by the 2014 ACM International Symposium on Mobile Ad Hoc Networking and Computing.

Collaborated project of ZJU-NCSU

MAIN DEVELOPER OF THE ISPACE SYSTEM

- Constructed an indoor localization system based on optitrack camera system-bluetooth-client computer.
- Designed the GUI for real-time information of the whole system.
- Implemented several single-robot tracking control algorithms.
- Designed and tested a multi-robot formation control algorithm using iSpace.

College Students Innovation Projects in Nankai University

ALGORITHM DESIGNER FOR AN UNDERGRADUATE INNOVATION PROJECT

- Hardware implementation of sinusoidal ultrasonic generator based on FPGA.
- Designed an algorithm for configuring frequency and amplitude of sinusoidal signal.

Hangzhou, China

Jul. 2012 - Jan. 2014

Hangzhou, China

Jul. 2012 - Jan. 2014

Tianjin, China

Mar. 2010 - Sep. 2011

Honors & Awards

OFF-CAMPUS

2016 **Silver Prize (2nd Place)**, 2016 Lost in Space High-Precision Vehicle Tracking Algorithm Competition

Beijing Bestrans

Traffic Technology

Co. Ltd.

IN-CAMPUS

2015 **Awardee (top 10%)**, Excellent Graduate Student Award

Zhejiang University

2015 **Awardee (top 5%)**, Lin Guangzhao & Hu Guozan Graduate Education Exchange Fund

Zhejiang University

Education Funding

2015 **Awardee (top 5%)**, Sifang Electric Scholarship

Zhejiang University

2014 **Awardee (top 20%)**, Excellent Ph.D Candidate Scholarship

Zhejiang University

2011 **Awardee (2nd Place)**, National Encouragement Scholarship

Nankai University

2010 **Awardee (3rd Place)**, First-Class Scholarship for Outstanding Student

Nankai University

2009 **Awardee (3rd Place)**, First-Class Scholarship for Outstanding Student

Nankai University

Hobbies

- Running, Cycling, Swimming, Hiking, Reading

Publications

- [C1] **Hao Liu**, Xianghui Cao, Jianping He, Peng Cheng, Jiming Chen, Youxian Sun. Distributed identification of most critical node(s) for average consensus. *Proceedings of IFAC World Congress 2014*, Cape Town, South Africa, Aug. 24-29, 2014.
- [C2] Lingkun Fu, **Hao Liu**, Liang He, Yu Gu, Peng Cheng, Jiming Chen. Demo: An energy synchronized charging protocol for rechargeable wireless sensor networks. *ACM Mobihoc 2014*, Philadelphia, PA, USA, August 11-14, 2014.
- [C3] Manjesh K. Hanawal, **Hao Liu**, Henghui Zhu, Yannis Ch. Paschalidis. Learning Parameterized Policies for Markov Decision Processes through Demonstrations. *IEEE Conference on Decision and Control 2016*, Las Vegas, NV, USA, Dec. 12-14, 2016.
- [J1] **Hao Liu**, Xianghui Cao, Jianping He, Peng Cheng, Chunguang Li, Jiming Chen, Youxian Sun *et.al.* Distributed identification of the most critical node for average consensus. *IEEE Transactions on Signal Processing*, vol. 63, no. 16, pp. 4315-4328, Aug. 2015.
- [J2] Henghui Zhu, **Hao Liu**, Armin Ataei, Jing Wang, Yannis Ch. Paschalidis. Learning from Animal "Experts" How to Navigate Complex Terrains. submitted to *PLOS one*.
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