Yi Wang

yi.wang@unh.edu Yi's homepage GitHub Google Scholar

RESEARCH INTERESTS

Artificial Intelligence, Robotics, Motion Planning, Heuristic Search, Autonomous Systems. My research focuses on efficient planning foundations with theoretical guarantees for robotic autonomy, aiming to reduce unnecessary computation.

RESEARCH EXPERIENCE

Ph.D. University of New Hampshire 2022–2026, completed

- Introduced the **first algorithm** that develops an anytime incremental lazy bidirectional heuristic search within batch-wise sampling motion planning, setting a new benchmark in efficiency & robustness in high-dimensional continuous state space.
- Developed the **first algorithm** for premature termination in bidirectional heuristic search while ensuring optimality and maintaining the *meet-in-the-middle* property.
- Contributed **Lazy Informed Trees** to the Open Motion Planning Library (OMPL).

OPEN SOURCE CONTRIBUTION

Open Motion Planning Library (OMPL) Contributor Oct 2025–present

BLIT*: An anytime incremental lazy bidirectional asymptotically optimal planner, officially merged into the **OMPL core library** and adopted within the motion planning community.

PUBLICATIONS

Peer-reviewed Conferences and Journals

- **Yi Wang**, Bingxian Mu, Shahab Shokouhi, and May-Win Thein."Optimal Kinodynamic Motion Planning Through Anytime Bidirectional Search with Tight Termination Condition" `Proceedings of IEEE International Conference on Control & Automation (ICCA)`, 2026.
- **Yi Wang**, Bingxian Mu, Oren Salzman. "Asymptotically Optimal Sampling-Based Motion Planning Through Anytime Incremental Lazy Bidirectional Heuristic Search" `Proceedings of IEEE International Conference on Robotics & Automation (ICRA)`, 2025.
- **Yi Wang**, Eyal Weiss, Bingxian Mu, Oren Salzman. "Bidirectional Search while Ensuring Meet-In-The-Middle via Effective and Efficient-to-Compute Termination Conditions". `Proceedings of International Joint Conference on Artificial Intelligence (IJCAI), 2025`.
- Xiangyu Zhang, **Yi Wang**, Bingxian Mu, Se Young Yoon. EMPC-Based Flight Control and Collision-Free Path Planning for A Quadrotor with Unbalanced Payload. `IEEE/ASME Transactions on Mechatronics (TMECH)`, 2025.
- Qinkun Xiao, **Yi Wang**, Haiyun Wang. Motion Retrieval Using Weighted Graph Matching[J].Soft Computing(ISSN: 1423−76431, Volume 19,Issue 1). Soft Comput(2015) 19:133-144. DOI:10.1007/s00500-014-1237-5.
- Qinkun Xiao, **Yi Wang**, Yichuang Luo. 3D Path Planning of Ant Colony Algorithm Using Partial Differential Elevation Modeling[J]. Journal of system engineering and Electronics (ISSN:1001-506x, Volume 37, Issue 7)(2015) 37:1552-1561. DOI:10.3969/1001- 506x.2015.07.14.
- Qinkun Xiao, **Yi Wang** and Song Gao. 3D Path Planning Based on Elevation Model and Ant Colony Algorithm[C]. Intelligent Human−Machine Systems and Cybernetics, 2013 Fifth International Conference (2013) 1:, 74-77. DOI:10.1109/IHMSC.2013.25.
- Qinkun Xiao, Junfang Li, **Yi Wang**, Zhao Li. Motion Retrieval Using Probability Graph Model[C]. Computational Intelligence and Design, 2013 Sixth International Symposium (2013) 2:150-153. DOI:10.1109/ISCID.2013.151.

Under Review & Work in Progress

- "Asymptotically Optimal Sampling-Based Motion Planning by Anytime Incremental Lazy Bidirectional Heuristic Search". Journal version in preparation to the International Journal of Robotics Research (IJRR).
- "Early Termination for Bidirectional Heuristic Search: Preserving Meet-in-the-Middle and Optimality". Journal version in preparation to Artificial Intelligence (AIJ).

HONORS & AWARDS

Special IJCAI 2025 DC Travel Award June, 2025

Awarded by the National Science Foundation (NSF) to selected U.S.-based Ph.D. students with accepted proceedings paper at IJCAI 2025.

ICRA 2025 Travel Grant Feb, 2025

Awarded by the IEEE Robotics & Automation Society (RAS) Member Support Program.

TALKS & INVITED ORAL

Lightning talk, Doctoral Consortium, IJCAI 2025 Aug, 2025
Selected as one of six lightning talks of selected papers from main conference track of IJCAI.

EDUCATION

University of New Hampshire
Ph.D. in System Design. 2022–2026
M.Sc. in Computer Science. 2017–2022
Project: Batch Informed Trees (BIT*) for a Dubins vehicle amid dynamic obstacles.

Xi'An Technological University
M.Sc. in Control Theory and Control Engineering. 2011–2014
Thesis: 3D Path Planning based on Ant Colony algorithm and Elevation Model, Research Mentor: Prof. Qinkun Xiao.

College of JinCheng of NUAA
B.Sc. in Electrical Engineering and Automation. 2006-2010
Thesis: Path Planning of Artificial Fields, Research Advisor: Prof. Congqing Wang.

PROFESSIONAL EXPERIENCE

`Teaching Assistant` 2017–2022, 2025–2026
Involved in creating assignments, exams and conducting recitation sessions for Intro to Computer Science (Java), Data Structure and Algorithms(C++), From problems to algorithms to programs(Python), An introduction to Artificial Intelligence, Systems modeling, simulations and control.

`Research Assistant` 2023–2025

COMMUNITY SERVICE

`Journal Reviewer`

- IEEE Transactions on Industrial Informatics (TII)
- IEEE/ASME Transactions on Mechatronics (TMECH)
- IEEE Industrial Electronics Magazine (IEM)
- International Journal of Robotics and Automation (IJRA)
- IEEE Canadian Journal of Electrical and Computer Engineering (ICJECE)
- Control Theory and Technology (CTT)
- IEEE Journal of Emerging and Selected Topics in Industrial Electronics (JESTIE).
- Transactions of the Canadian Society for Mechanical Engineering (TCSME)

PRIOR RESEARCH PROJECTS

Motion Retrieval Using Graph Modeling 07/2013-06/2014
- National Natural Science Foundation of China NO:61271362

Path Planning Algorithm of outdoor Environment For UGV 12/2012-06/2013
- Research Projects of Shaanxi Province Education Office NO:12J0510

Retrieval of Multi-Motion System In A Multi-perspective Environment 12/2012-12/2012
- National Natural Science Foundation of Shaanxi Province NO:2012JM8028

Retrieval of Multi-View Moving Objects Under A complex Environment 01/2012-06/2012
- Special Funds of Shaanxi Province Education Office NO:12JK0727

Road Detection Based on Machine Vision 12/2012-06/2013
- Special Funds of Xi'an Technological University NO:XG001

TECHNICAL SKILLS

Languages: C++, C, R, Python, Matlab, Java.
Robotics Tools: OMPL, MoveIt!.
Dev Tools: Linux, Github.