Ruiqi Ni

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EDUCATION

Purdue University, West Lafayette, IN, USA
Ph.D. in Computer Science — Jan 2022 – Present

Florida State University, Tallahassee, FL, USA
Graduate Studies in Computer Science — Aug 2019 – Dec 2021

University of Science and Technology of China, Hefei, Anhui, China
B.S. in Information and Computing Science — Sep 2014 – Jun 2018

RESEARCH INTERESTS

Robot Learning; Motion Planning and Control; Physics-based Simulation

PUBLICATIONS

"SE(3)-NTFields: Physics-informed Neural Time Fields for Prehensile Object Manipulation",
Hanwen Ren, **Ruiqi Ni**, Ahmed H. Qureshi.
IEEE/RSJ Intl. Conf. on Intelligent Robots and Systems (IROS), 2025.

"Physics-informed Neural Motion Planning via Domain Decomposition in Large Environments",
Yuchen Liu, Alexiy Buynitsky, **Ruiqi Ni**, Ahmed H. Qureshi.
IROS, 2025.

"Physics-informed Temporal Difference Metric Learning for Robot Motion Planning",
Ruiqi Ni, Zherong Pan, Ahmed H. Qureshi.
Intl. Conf. on Learning Representations (ICLR), 2025.

"Physics-informed Neural Mapping and Motion Planning in Unknown Environments",
Yuchen Liu*, **Ruiqi Ni***, Ahmed H. Qureshi.
IEEE Trans. on Robotics (T-RO), 2025.

"Physics-informed Neural Motion Planning on Constraint Manifolds",
Ruiqi Ni, Ahmed H. Qureshi.
IEEE Intl. Conf. on Robotics and Automation (ICRA), 2024.

"Progressive Learning for Physics-informed Neural Motion Planning",
Ruiqi Ni, Ahmed H. Qureshi.
Robotics: Science and Systems (RSS), 2023. (Workshop Oral)

"NTFields: Neural Time Fields for Physics-Informed Robot Motion Planning",
Ruiqi Ni, Ahmed H. Qureshi.
ICLR, 2023. (Spotlight; Workshop Best Paper)

"Multi-Robot Path Planning in Complex Environments via Graph Embedding",
Xifeng Gao, Zherong Pan, **Ruiqi Ni**.
IEEE Robotics and Automation Letters (RA-L), 2022.

"Robust Multi-Robot Trajectory Optimization Using Alternating Direction Method of Multiplier",
Ruiqi Ni, Zherong Pan, Xifeng Gao.
IEEE RA-L, 2022.

"Robust & Asymptotically Locally Optimal UAV-Trajectory Generation Based on Spline Subdivision",
Ruiqi Ni, Teseo Schneider, Daniele Panozzo, Zherong Pan, Xifeng Gao.
ICRA, 2021.

"Progressive Parameterizations",
Ligang Liu, Chunyang Ye, **Ruiqi Ni**, Xiaoming Fu.
ACM Trans. on Graphics (SIGGRAPH), 2018.

RESEARCH EXPERIENCE

Purdue University

Research Assistant Jan 2022 – Present
Advisor: Prof. Ahmed H. Qureshi

- Project: Physics-informed Neural Motion Planning
  - Proposed PINN-based Eikonal solvers yielding continuous cost-to-go functions for planning.
  - Developed TD loss with metric learning for scalable training and policy extraction.
  - Extended to constraint manifolds and unknown environments for real-time mapping and planning.

Florida State University

Research Assistant Aug 2019 – Dec 2021
Advisors: Prof. Xifeng Gao; Dr. Zherong Pan

- Project: Robust Robot Trajectory Optimization
  - Designed asymptotically optimal trajectory optimization with continuous collision detection.
  - Developed ADMM-based multi-agent optimization decoupling objectives from collision constraints.

University of Science and Technology of China

Undergraduate Research Assistant Sep 2017 – Jun 2018
Advisors: Prof. Ligang Liu; Dr. Xiaoming Fu

- Project: Progressive Mesh Parameterizations
  - Built a progressive optimization framework improving efficiency and robustness across complex geometries.

WORK EXPERIENCE

XPeng

Research Intern Jun 2025 – Present
Advisors: Dr. Chenyi Chen; Nathon Zhao

- Project: Vision-Language-Action (VLA) Models
  - Built manipulation data-generation pipelines combining simulation capture with reasoning-based annotations.
  - Evaluated and improved VLA reasoning for long-horizon task planning.
  - Applied diffusion models and flow matching for action learning to improve stability and control accuracy.

Lightspeed Studio, Tencent America

Research Intern May 2024 – Aug 2024
Advisor: Dr. Zherong Pan

- Project: Temporal Difference Learning for Motion Planning
  - Implemented TD-based planning algorithms accelerating convergence in large-scale environments.
  - Integrated physics-informed models with sampling-based planners for scalable training.

Adobe Research

Research Intern May 2021 – Aug 2021
Advisor: Dr. Kevin Wampler

- Project: Constrained Vector Graphics Editing
  - Developed optimization algorithms enabling constraint-driven editing with prioritized geometric constraints.

SERVICE

Reviewer

Journals: IEEE T-RO; IEEE RA-L; TASE; The Visual Computer
Conferences: CoRL; SIGGRAPH; SIGGRAPH Asia; ICRA; IROS; ICLR