Neoscholar Evaluation Letter

Yanzhe Zhao served as the team lead for the project "Nonholonomic Narrow Dead-End Escape with Deep Reinforcement Learning" and was instrumental in both shaping the research direction and executing its technical implementation. From the outset, he proactively drove team discussions, helping to define the project's novelty—applying DRL to navigate Ackermann vehicles out of narrow dead ends while respecting nonholonomic constraints. His conceptual clarity and ability to translate ideas into concrete methodologies were critical in framing the problem and designing the policy architecture with kinematic embedding.

On the technical side, Yanzhe established the team's core infrastructure, configuring VMware environments and ROS-based simulation pipelines, and integrating Gazebo scenarios to model complex dead-end geometries. He contributed substantial code, implemented the reinforcement learning framework, and designed experimental protocols, demonstrating both precision and innovation. Throughout the project, he maintained proactive ownership of tasks and regularly engaged with instructors and TAs to refine solutions, troubleshoot technical challenges, and optimize system performance.

Overall, Yanzhe's combination of leadership, technical expertise and persistent engagement made him the driving force behind the team's success, and I can see his strong potential as an excellent researcher.

Signature of evaluator:

E-mail address of evaluator: senwang.steven@gmail.com

Neoscholar Evaluation Report

Scholar Information

Name: Yanzhe Zhao

Title of Group Paper/ Individual Paper： Nonholonomic Narrow Dead-End Escape with Deep Reinforcement Learning

Academic evaluation levels awarded by the professor: A

Evaluator Information

Name: Sen Wang

Full Title: Professor of Robotics and Autonomous Systems

Program Information

Program Structure: 12 Advancement Courses+ 5 stages Mastertrack Research

Student time investment: A total 122 class hour

Research skills training- 16 class hours

Advancement Course- 54 class hours

MasterTrack Research- 52 class hours

Evaluation Description

The student was selected from a competitive pool of applicants to join the Mastertrack research group, where they actively participated in a research-based program. Under the guidance of renowned professors, the student conducted research projects, followed standardized academic procedures, and gained authentic research experience.

The CIS program is a comprehensive research-training initiative, consisting of a 12-week Advancement Course followed by a five-stage Master-track Research sequence. Its admissions standards and academic expectations take inspiration from those of a year-long graduate-level program, in an effort to offer students meaningful research training within a limited timeframe.

As student's mentors, program professors and mentors provided consistent instruction and guidance through five key phases: foundational academic training, proposal development, literature and data research, manuscript review, and final defense.

Throughout the program, program professors and mentors carefully documented the student's progress at each stage and compiled a detailed evaluation of their academic performance. We believe this assessment offers a thorough overview of the student's strengths and areas for growth within the field.

Criteria	N/A	Poor	Below average	Average	Good	Excellent
Advancement Course 1-12						
Mid-term						✓
Homework						✓

Final						✓
Course Engagement						✓
Stage 1 Research Proposal						
Innovation: Incorporate interdisciplinary knowledge and methods into the topic to form new research perspectives.					✓	
Viability: The ability to comprehensively consider various aspects such as feasibility and regulations, and to possess critical thinking skills to address research problems.					✓	
Stage 2 Literature Research& Experiment Design						
Systematically: Precise identification of data sources and accurate collection of documentary information.					✓	
Criticality: Ability to interpret literature and data results thoroughly and correctly.					✓	
Stage 3 Data, Code Models, or Literature Argumentation						
Effectively: Efficient data collection and literature review in accordance with the research programme.					✓	
Collaboratively: The ability to arrange tasks within the team reasonably and possess strong communication skills.					✓	
Stage 4 Paper Writing and Review						
Problem solving: Ability to rationalise research programme optimization and effectively address research issues.					✓	

Academic writing: Maintaining the ethical qualities of academic research paper writing and producing a high-quality research paper is challenging but essential.					✓	

Stage 5 Paper Defense and Evaluation						
Visually: Being able to visually present research papers effectively aids in explaining them.					✓	
Proficient: To have a comprehensive understanding of one's research topic and to be able to accurately answer questions posed by the professor.					✓	

Please briefly explain the requirements of the research paper, your interaction with the scholar, and evaluate the student's performance in the research process.

This intensive research course immersed students in cutting-edge robotics research at the standard of peer-reviewed major international robotics conferences. Students worked in small teams to conceive, implement, and document original research projects addressing current challenges in robot perception, localization, and autonomous navigation.

Students pursued projects in emerging robotics domains, selecting from topics including neural scene representations, object-level semantic SLAM systems, robust multi-sensor perception, learning based navigation, Embodied AI. Through guided mentorship, students developed comprehensive literature reviews on their chosen topics, exploring state-of-the-art techniques from premier robotics venues. The instructional team supported students in discovering and critically evaluating research sources, clustering them by methodological approaches, theoretical frameworks, and technical contributions. This foundational work enabled students to refine their research questions and select appropriate methodologies—spanning simulation-based validation, real-world experimentation, and algorithmic development, while accounting for course constraints and resource availability.

Students implemented their research using research-standard tools including Robot Operating System (ROS), PyTorch/TensorFlow, Gazebo simulation, and real robotic datasets. Real robot platforms based on HiWonder mobile robot, Livox Lidar sensor, ZED2 cameras were also provided in the course. They conducted rigorous experimentation, analyzed results using established robotics metrics, and discussed findings in the context of current literature. Final papers formatted to conference submission standards with proper citations managed through Zotero and LaTeX. The course provided explicit guidance on appropriate use of AI tools (like LLMs) for development, documentation and research assistance.

Upon completion, students demonstrated the ability to:
- Critically evaluate and synthesize robotics literature from premier academic venues
- Design and implement novel robotics algorithms in emerging domains (NeRF, Gaussian Splatting, LLM navigation, etc.)
- Conduct rigorous experimental validation using simulation and real-world data
- Collaborate effectively in research teams while making independent technical contributions
- Produce conference-ready papers demonstrating mastery of academic robotics standards
- Present and defend research findings to audiences

Students completed the course with submission-ready papers, a comprehensive understanding of robotics research methodologies, and research capabilities.

*CIS affirms that the evaluation forms and textual assessments are designed strictly according to the logical sequence of the research process. Professors and mentors meticulously evaluate students' research qualities and skills in line with each stage of the process, and rate the students' performance accordingly. If there are any questions regarding the work's academic integrity or any aspects of the research program, please contact us. We will conduct an immediate review and respond to your questions promptly.