**Finalized Papers for Literature Review**

1. Taheri and Hosseini (2024) – “Deep Reinforcement Learning with Enhanced PPO for Safe Mobile Robot Navigation”

***The paper proposed enhanced PPO algorithms to optimize the safety of reinforcement learning in dynamic environments, providing theoretical and algorithmic support for our PPO robot navigation framework.***

* + DOI: 10.48550/arxiv.2405.16266

1. Wang, X. (2025) – “Mobile Robot Environment Perception System Based on Multimodal Sensor Fusion”

***It researches multi-modal sensor fusion which is studied to enhance robot environment perception by combining LiDAR, IMU, and camera to provide background support for our visual perception and multi-sensor data fusion.***

* + DOI: 10.54254/2755-2721/2025.20215

1. Tsuruta and Morioka (2024) – “Autonomous Navigation with Monocular Camera Using DRL and Segmentation”

***Here Combining Deep Reinforcement Learning (DRL) and Semantic Segmentation to achieve path planning using a monocular camera provides a key approach to combining visual navigation with reinforcement learning, which is essential for our research on image-based navigation.***

* + DOI: 10.1109/sii58957.2024.10417188

1. H. Ma, S. Wang, S. Zhang, S. Ren and H. Wang, "Map-less End-to-end Navigation of Mobile Robots via Deep Reinforcement Learning," 2023 IEEE 13th International Conference on Electronics Information and Emergency Communication (ICEIEC), Beijing, China, 2023, pp. 48-52. Cited by: 2.

***Ma et al. (2023) proposed DRL-based end-to-end mapless navigation using LTD3 (Long-Term TD3) + LSTM for navigation in dynamic environments, where the robot is trained and tested at randomly initialized positions to improve environmental adaptation.***

* + DOI: 10.1109/ICEIEC58029.2023.10200799

1. Schneider and Stemmer (2024) – “CNN-based Multi-Object Detection and Segmentation in 3D LiDAR Data”
   * DOI: 10.20944/preprints202410.0496.v1
2. Y. Zhang, W. Feng, Z. Yang, Z. Zhou, Z. Zhu and W. Wang, "Visual Navigation of Mobile Robots in Complex Environments Based on Distributed Deep Reinforcement Learning," 2022 6th Asian Conference on Artificial Intelligence Technology (ACAIT), Changzhou, China, 2022, pp. 1-5. Cited by: 3.

***Zhang et al. (2022) using distributed DRL which is different with traditional DRL, combining PPO with LSTM to perform maples visual navigation. The method enables robot to perform efficient path planning and obstacle avoidance in complex environments***

* DOI: 10.1109/ACAIT56212.2022.10137974

7. Liu, X.-Y., & Wang, J.-X. (2021). Physics-informed Dyna-style model-based deep reinforcement learning for dynamic control. *Proceedings of The Royal Society A: Mathematical, Physical and Engineering Sciences*, *477*(2255).

* DOI: 10.1098/RSPA.2021.0618

**Supplementary**

8. Joseph Rish Simenthy and J.M Mathana, "Exploring and Analysing Deep Reinforcement Learning Based Algorithms for Object Detection and Autonomous Navigation," 2024,

* + DOI: 10.1109/adics58448.2024.10533558

9. Issa et al. (2021) – “Double Deep Q-Learning and Faster R-CNN for Vehicle Navigation” This paper used Double Deep Q-Learning and Faster R-CNN, the effect of fusion of reinforcement learning and target detection is demonstrated to provide a comparative approach to combining reinforcement learning and computer vision for our research.

* + DOI: 10.3390/s21041468

10. Qu et al. (2021) – “An Outline of Multi-Sensor Fusion Methods for Mobile Agents Indoor Navigation”

* + DOI: 10.3390/s21051605

11. Lu, S., Zhong, P., Ye, S.-T., Chen, B., Sheng, Y., & Liu, R. (2024). *SocialNav-FTI: Field-Theory-Inspired Social-aware Navigation Framework based on Human Behavior and Social Norms*. 4808–4815.

* DOI: 10.1109/iros58592.2024.10802269

**Additional Info**

PPO + CNN/LSTM + Semantic Segmentation

* DRL Responsible for route planning and decision-making
* CNN/Transformer + segmentation（eg. DeepLabV3, Mask R-CNN）Responsible for environmental awareness
* Dataset:
  + Matterport3D: <https://niessner.github.io/Matterport/>
  + SUN RGB-D: <https://rgbd.cs.princeton.edu/>

LSTM/Transformer Responsible for historical information storage to increase adaptation to dynamic barriers