**Background: Autonomous Navigation**

Autonomous navigation is a fundamental problem of mobile robots, which aims to identify an optimal or suboptimal path from a starting point to a target point in a Two-Dimensional (2D) or Three-Dimensional (3D) environment while avoiding obstacles.

**Challenges in AI-Based UAV Navigation**

- **Pros:**
  - They can provide scalable solutions for large operation environments.
  - Require little manual-engineering.

- **Cons:**
  - Weak adaptability to new environment
  - Low sample efficiency

**Design Goals**

- Model generalizability across heterogeneous vehicles
- Fast adaptation to dynamic environments (Short training time for new environments)
- Lifelong learning ability
- Flight/operation safety during learning process

**Learning-Based Navigation Methods: State-of-the-art**

- Deep learning
- Reinforcement Learning
- Deep Reinforcement Learning

**Simulation Framework**

Programmable Engine for Drone Reinforcement Learning Applications (PEDRA) [1] is utilized as simulation environment.

**Ongoing and Future Works**

- Implementation of the proposed algorithm will be completed.
- Adaptability and transferability will be evaluated in indoor and outdoor maps.
- The proposed application will be extended for the urban airspace scenarios.

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