Controlling Robotic Swarms Using LLMs

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This paper presents an approach to utilizing Large Language Models (LLMs) for the control and coordination of robotic swarms. It explores how LLMs can improve the efficiency of swarm robotics in tasks such as decision-making, task translation, and collision avoidance. The study includes both simulations and real-world experiments, employing drones to demonstrate the practical application of LLMs in translating complex human instructions into coordinated actions by robotic swarms. The project aims to develop a dedicated library for Espressif microcontrollers, enhancing their integration into swarm robotics. Their use with LLMs could be beneficial due to their low operational power. The study contributes to the fields of multi-robot systems and LLMs, showcasing innovative ways to enhance the functionality and efficiency of robotic swarms. Additionally, we explore the capabilities of prompt-tuned LLMs to engage in free-form dialogue, synthesize code, and employ task-specific prompting functions and closed-loop reasoning through dialogues, further broadening their application in swarm robotics.

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