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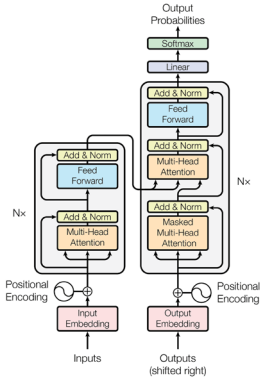
Enhancing UAV Control with Large Language Models: Natural Language Interfaces and Context-Aware Guidance

In current military and civilian scenarios, unmanned systems (UxS) are mainly controlled manually (e.g. FPV control) or by means of waypoint-based flight guidance. With the help of higher levels of automation, it is also possible to control several UxSs or even swarms of UxSs. With the increase in the guidance range due to the increasing number of UxSs operating independently of each other at the same time and an enlarged operational area, the operation of the guidance system by one operator becomes disproportionately challenging. In the project proposed here, we investigate the use of Large Language Models (LLM) to support the operator with the following two functions:

1. **Flexible interface to the management system**: The language models serve as an interface that enables instructions in natural language (chat/voice interface) for operating the software.
2. **Context-sensitive interpretation** of voice commands in UAV guidance actions regarding mission and other context information (e.g. weather, no-fly-zones, ...)

Your tasks



- Review the literature about the usage of LLM as interfaces for mobile systems
- Develop a technical concept and simulation environment to evaluate performance of LLMs in the management of UAVs
- Select and fine-tune models for evaluation
- Evaluate models with users in the virtual simulation

Your Profil

- Studying Computer Science/Engineering (HCI, HMI)
- Interest in human-centered use of AI
- Experience in Python/C++
- Experience with integrating and fine-tuning LLMs
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Kontakt

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