Student/Master Project:
Voice Control for a Camera System

Description: Maritime Search and Rescue (SAR) operations are getting more complex with constant increases in commercial as well as private traffic. In order to successfully locate vessels and people in distress, SAR ship operators need to engage sophisticated camera systems and manually steer them in the proper direction. However, due to a limited number of crew members, manual camera control with joysticks or physical buttons usually implies the suspension of active ship navigation. With this project, we aim to assist SAR cruiser operators with the robust voice-controlled camera system by freeing their hands for challenging vessel navigation.

Prerequisites:
- Python programming skills
- Linux skills

Activities:
- Familiarize with the device (Raspberry Pi), Operating System, peripherals (Microphone), connectivity, and installations
- Identification of suitable voice commands (around dozen of words/phrases) for hands-free camera steering (e.g. zoom in, zoom out, move left, move right, etc.)
- Identification and comparison of lightweight offline open-source AI tools for speech recognition

Results:
- Creation of a small voice-controlled device that can operate independently (offline) and replace physical camera control buttons
- High accuracy with robustness to the background noise due to a limited number of voice commands
- Dual language support with English as a base
- Demonstrate voice control (including activation word) with a simple program

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References:

[1] S. Pal, A. Chauhan, S.K. Gupta. Voice Controlled Smart Home Automation System, International Journal of Recent Technology and Engineering 8(3), 2019