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The Dos and Don'ts When Building a Video Streamer for Research

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High resolution video recordings at high frame rates are necessary for a variety of research projects. This can pose a challenge for systems in terms of hard- and software, particularly if multiple streams need to be recorded simultaneously. The aim of this project was to design a setup that would allow for the recording of multiple streams at high frame rates and various image resolutions, while still satisfying the given resource constraints. The specifics of the project made it necessary to build a custom processing pipeline that would bypass limitations from the camera vendor's default software suite. Our custom setup allows for the simultaneous recording and saving of the resulting videos directly to a file server in our on-site data center. We will discuss the connection of multiple cameras through a switched high bandwidth network infrastructure for recording on a single compute node of a high performance computing (HPC) cluster. The details of the development and installation, including challenges faced, will also be presented. This includes the pros and cons of using the IBM POWER architecture, the setup of a specific Conda environment on an IBM POWER9 processor, and the building process for required packages including FFMPEG and OpencCV with GPU support. The GPU support is an important aspect in the setup, as it can reduce some of the high load on the CPU caused by the simultaneous recording of streams. We will present results obtained with a multi camera setup, with recordings at a frame rate of 100 Hz.

I want to participate in the youngRSE prize

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