# Idea doc

- Concept:

There will be a camera placed in the room that will use AI to count the number of 'heads' (shapes) currently in the room. For more accuracy, more cameras can be used to cross reference. If the result of the count is not the same on both cameras, it will count again until both cameras count the same number of occupants. For the best result, make sure both cameras are separated but still able to see the entire table.

- Hardware components:

* Jetson Nano / Raspberry Pi
* 1 or more cameras

- Code language / libraries:

OpenCV Java SDK, Java

- Pros / cons:

Pros:

* High Accuracy in Well-Lit Environments

OpenCV with cameras in a well-lit room can provide highly accurate people detection.

* Supports Complex Detection Models

Advanced algorithms/deep learning models (such as YOLO) can be used to count the amount of people in the room.

* Scalable for Different Applications

OpenCV can be used on different platforms (PC, Raspberry Pi, Jetson Nano) and supports edge processing (on device).

* Privacy

Using edge processing (on-device) or blurring faces ensures that no sensitive personal data are stored or transmitted. And frames can be immediately disregarded after detection.

Cons:

* Privacy Concerns

Although faces can be blurred and the data made anonymous, cameras still record visible data that can lead to privacy concerns. Even if you don’t save footage.

* Lightning Sensitivity

Cameras need good lighting to work effectively. In low-light or dark environments, the detection accuracy drops significantly.

* High Data Processing

Video data can be large, requiring more computational resources for processing. This could make real-time detection slow, especially if using deep learning models on low-powered hardware like Raspberry Pi.

* Obstructions

Camera-based systems may struggle in environments with obstructions, such as rooms with many objects, curtains, furniture etc. which can block the camera's field of view.

* Setup and Calibration

The installation, setup, and calibration of cameras can be complex to find the optimal positions and may require fine-tuning.