Selecting Primary Camera Model

1. Introduction

The camera model selection is one of the most critical tasks for the “Campus Watch” project. The feed of the camera model determines the overall reliability of the project. When selecting a primary camera for CampusWatch, consider the following:

1. **Resolution vs Bandwidth & Storage**
    - Higher resolution (4K) → better detail, but more storage, more network load.
    - Must balance the cost of storage/ingestion.

2. **Lens & Field of View**
    - Fixed lens vs varifocal. Varifocal allows adjusting the angle/distance.
    - A wide version might cover more area but detail might drop per subject.

3. **Night Performance / Low Light**
    - IR range (how far it can see in darkness).
    - Presence of “white LED” / floodlight / “starlight” sensors helps in low-light.

4. **Smart Features**
    - AI detection (people/vehicles).
    - 2-way audio.
    - On-device processing vs cloud.

5. **Durability / Environmental Specs**
    - Weatherproof rating (e.g. IP66, IP67).
    - Operating temperature.

6. **Power / Connectivity**

- PoE (Power over Ethernet) is robust and sometimes has simpler wiring.
- Wireless/battery options only if the infrastructure is hard.

7. **Cost, Vendor Support, Warranty**
    - Not just upfront cost, but support, warranty, and availability of parts.

2. Research and Findings

Since I don't have any experience with security cameras and their technical detailing, I had to heavily depend on Google and GPTs for my research on camera models.
I have created a sheet for my 5 findings, where I have explored the different dimensions while purchasing a security camera. The link to the sheet is: Link.

Based on my research, I have decided to use the Hikvision DS-2CD2083G0-I as the primary camera model for CampusWatch because it delivers 4K/8MP fixed resolution imaging with efficient **H.265+ compression**, balancing very high detail (for recognizing faces, license plates, etc.) with manageable storage and network load. It offers fixed‑lens options (2.8 / 4 / 6 / 8 mm) so you can choose a field of view depending on placement (wide angle or more focused), though without mechanical parts that might increase maintenance. With a true **120 dB WDR** and an IR range of up to **30 meters**, it handles challenging lighting and low-light/night conditions effectively. It is built outdoors, ready (IP67 water/dust resistance, metal body), and supports PoE for simpler wiring. It includes useful smart features such as line crossing, intrusion detection, motion detection, and onboard micro-SD storage (up to 128 GB), which help reduce the load on central systems. Taken together, it gives strong performance, robustness, and feature-rich value that makes it a good "sweet spot" model between cost, durability, and functionality for a campus security system.