# Sensor Configuration & enumeration
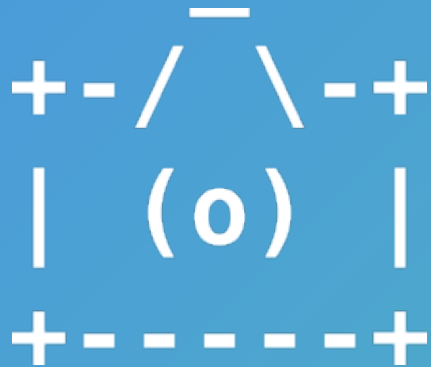
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lib camera

# Problem

Configuration of RAW Image sensors

Quering camera capabilites on top of libcamera

**Problem statement**

# Problem

Configuration of RAW Image sensors

- `Mode-based`
- `Free Sensor Configuration`
- `Enumerate capabilities without config changes`
- `One ioctl for enumeration`
- `One ioctl for configuration`

# Status quo

- libcamera picks a suitable sensor configuration based on output streams asked by application

- Applications have been  abusing the RAW stream configuration in order to get precise control over the sensor

**Status quo**

# Mode based sensors

- Easy, expose the mode details
  - Frame size, analog crop, FoV...

- Possibly easier to enumerate and expose. Easier for applications to consume

**Mode based sensors**

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# Mode based sensors

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- What about HDR modes?
  Sensor might be outputting interleaved lines with different exposures so output size will be larger.

**Mode based sensors**

# Free Configuration

- Provides fine grained control over sensor

- Application might need lot of information upfront

- Enumerating every scenario possible scenario through TRY_FMT?

**Free configuration**

# Free Configuration

- More possibilities to get pipeline stranded
  sensor output > ISP Input bandwidth

- "Suitable" lists of known configurations needed to stored upfront in userspace

- A freely configurable API might not work well

- Achieves "exotic" use cases for highly specialised applications

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**Free configuration**

# Conclusions:

- Preferring one model over the other is hard

- Aim not to restrict what can be acheived but just simplify the presentation

- Possibly start from selecting a sensor mode or a sensible "preset" to achieve freely configurable model

- Capability of pipeline takes preference rather than single entity

# Thank you!

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