

Battery-Free, Connected Machine Vision

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Why Battery-Free Sensing?

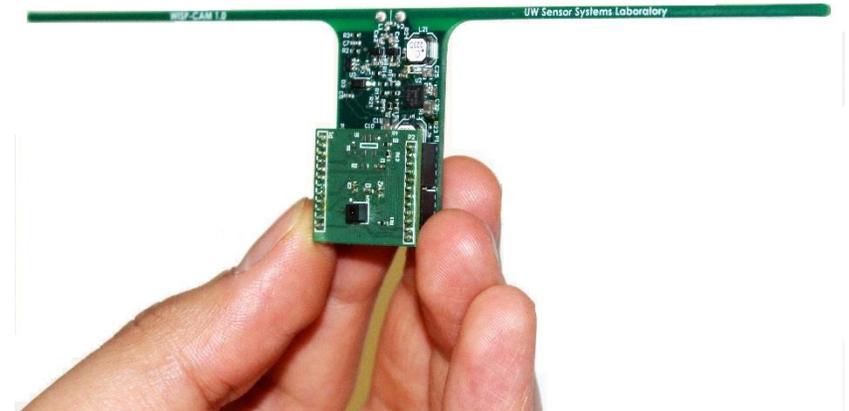
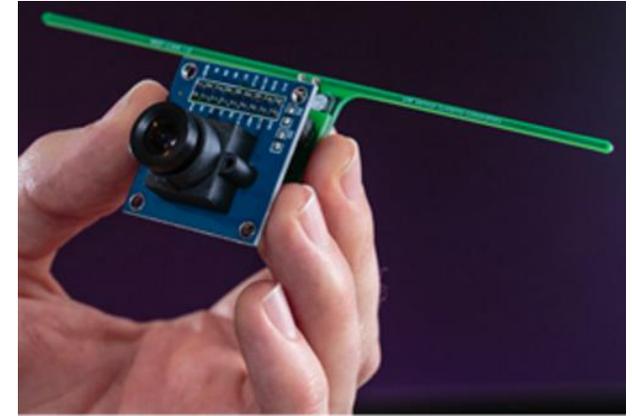
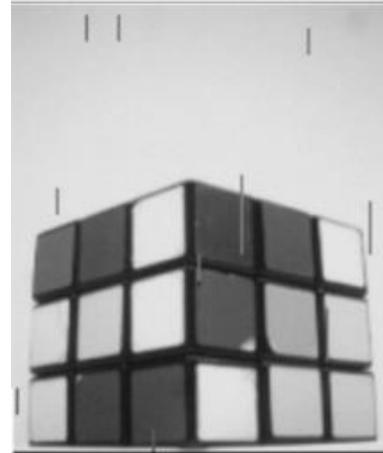


- By 2020 there will be 50 billion connected devices and 44ZB data generated per year.
 - 50 billion dead batteries?!
 - Internet of battery-free things



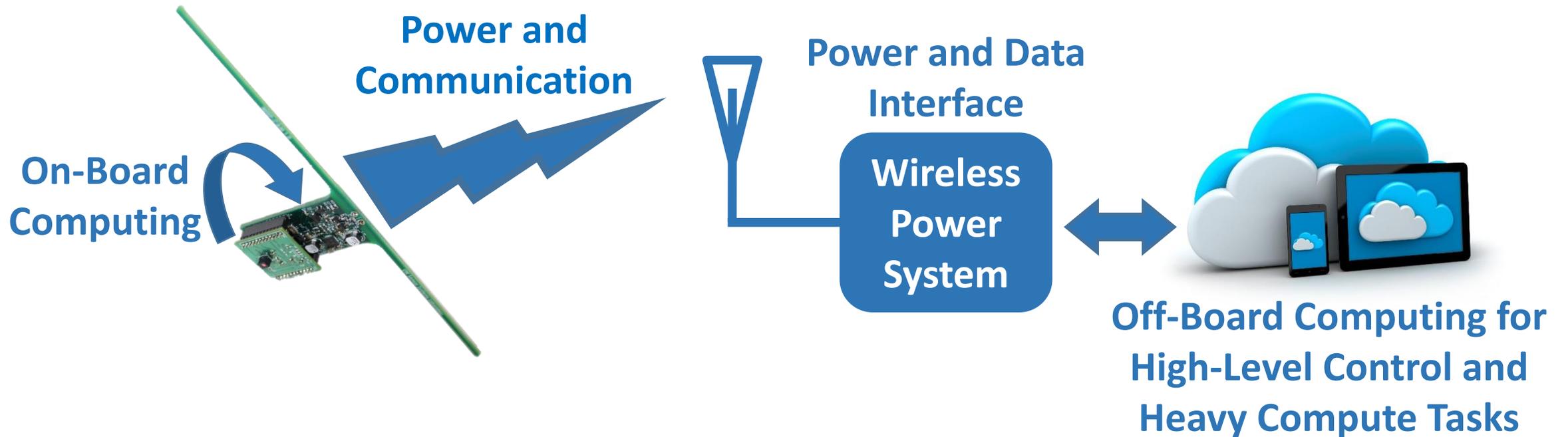
Battery-Free Camera

- One of the most challenging sensors to wirelessly power
 - High power consumption
 - Rich output data



Battery-Free Camera Limitation

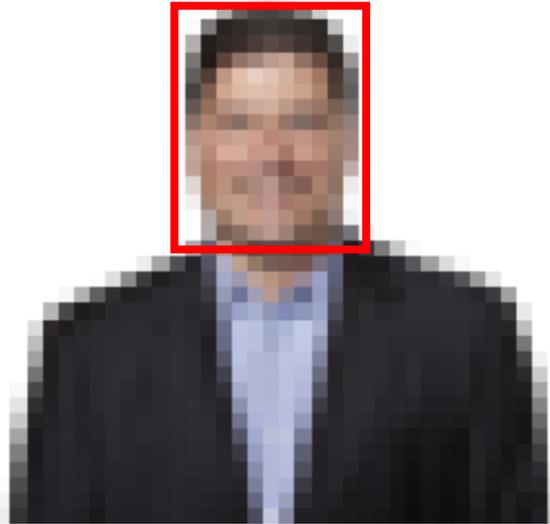
- 1) On-board Storage
- 2) Computational Capabilities
- 3) Communication Speed



Computation Partitioning Example



Impossible



Possible



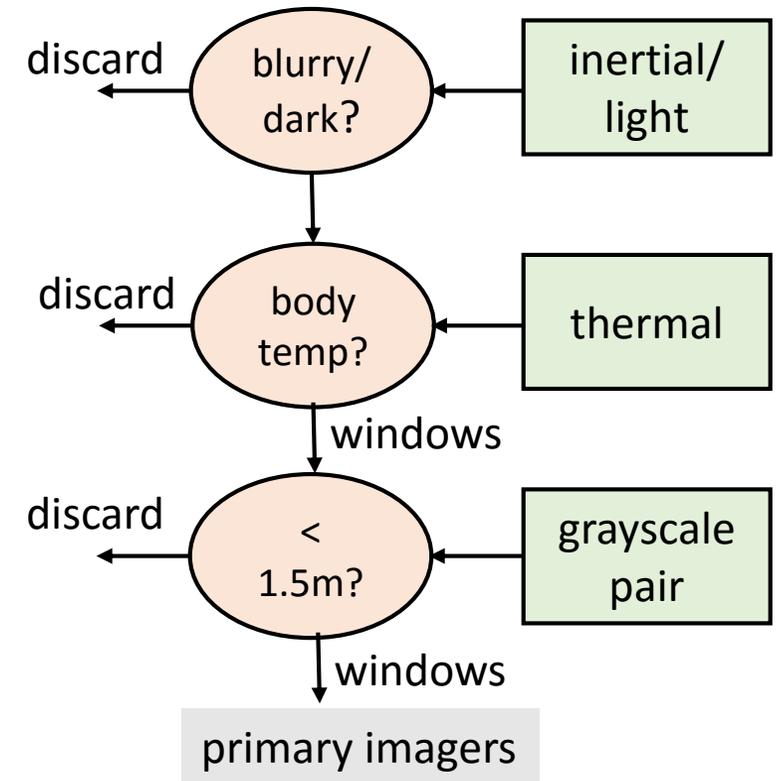
Possible

Face Recognition on Battery-Free Camera

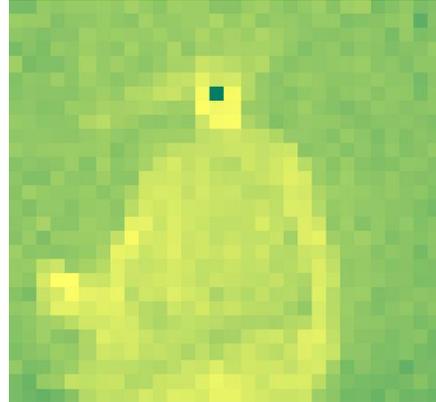
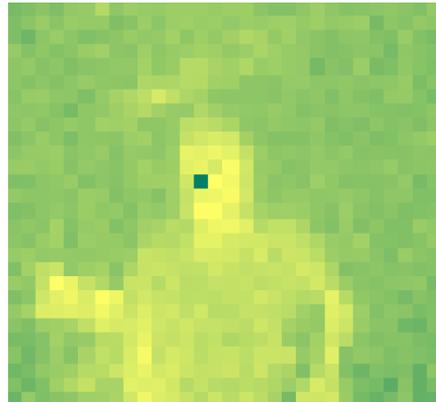
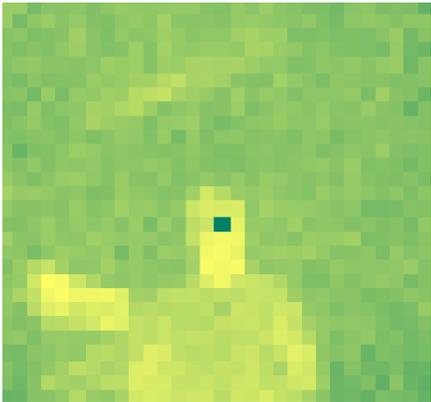
Low-Power Wearable Continuous Mobile Vision

Glimpse Camera, Programmable early discard camera architecture:

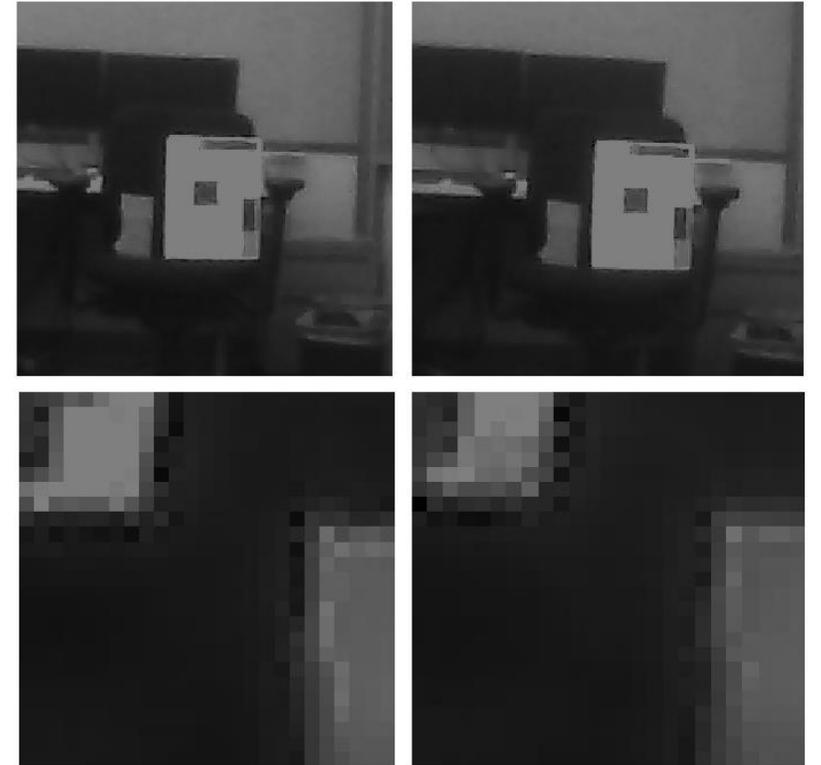
- Most pixels are irrelevant
- Some low-power sensors can predict them



Algorithm Development



FIR Tracking



Stereo Pair

Summary

- WISPCam a battery-free camera.
- Implementing the interfaces to connect WISPCam to plugged in PC.
- Pushing the envelope further to bring machine vision into battery-free domain.

Thank you!
Questions?

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