

Low-power motion detection and building control using Computer Vision

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Outline

- Motivation
- Problem with current technology
- Proposed solution
- Milestones



Motivation

- Intelligent low-power motion detector
 - Doesn't turn the lights off on you
 - Detects your presence in the room

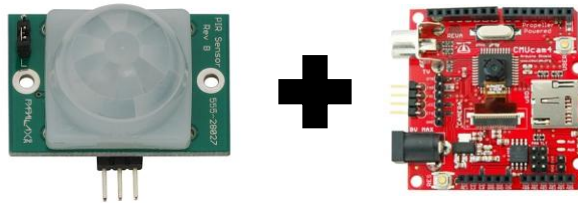


Problems with current Motion Detectors

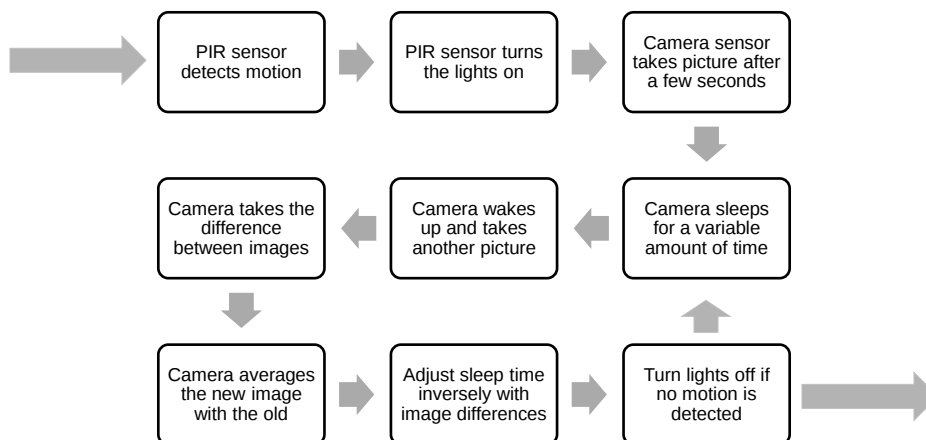
- Current motion detectors use PIR sensors
 - Can't detect small amounts of motion reliably
- PIR sensors do not detection motion but instead detect room temperature
 - Your movement in and out of view changes the temperature the PIR sensor sees

Solution

- Use a PIR motion detector and a low-power computer vision system together



Theory of Operation



Milestones

- Test rig setup and image processing code complete
 - by November
- Application complete and starting result gathering
 - by Thanksgiving

Realities

- My group partner dropped
 - Homework, presentations, and report overhead will likely impede progress



Questions?



References

- C. Stauffer, W.E.L. Grimson, “Adaptive background mixture models for real-time tracking”, published.
- M. Piccardi, “Background subtraction techniques: a review”, unpublished.
- A. Verdant, A. Dupret, H. Mathias, P. Villar, L. Lacassagne, “Low Power Motion Detection with Low Spatial and Temporal Resolution for CMOS Image Sensor”, published.
- K. Agyeman, “CMUcam4: Open Source Programmable Embedded Color Vision Sensor”, unpublished.