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Infrared dataset generation for people detection through superimposition of different camera sensors

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Attributes of infra-red cameras

- Useful additional information
- Non-invasive measurement
- Compact sensors

- Resolution
- Noise affectancy
- Availability of IR image datasets

Goals of the paper

1. Low-cost & low-power **thermal scanner** prototype
2. **Human detection** feasibility
3. Public **self-labelled** dataset for IR training

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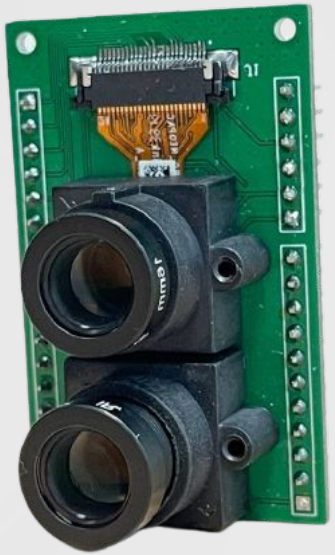
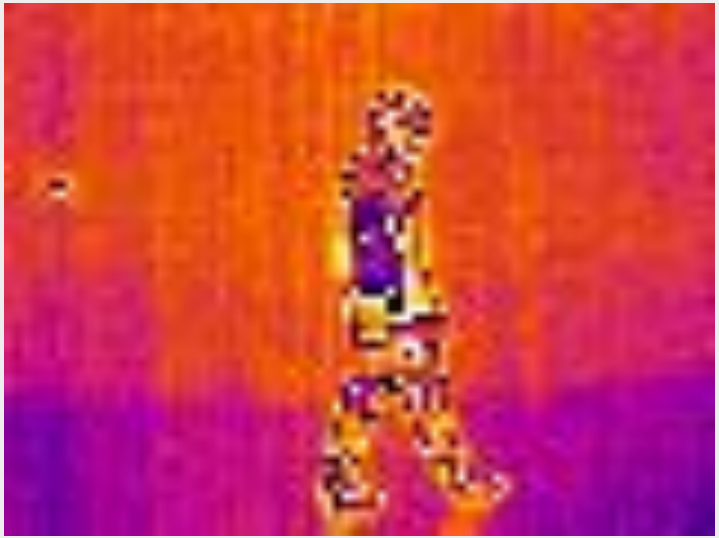
System architecture

- STM32 F401
- Lepton Flir v2.0
- Himax HM01B0



Raw dataset

- **3700**+ images

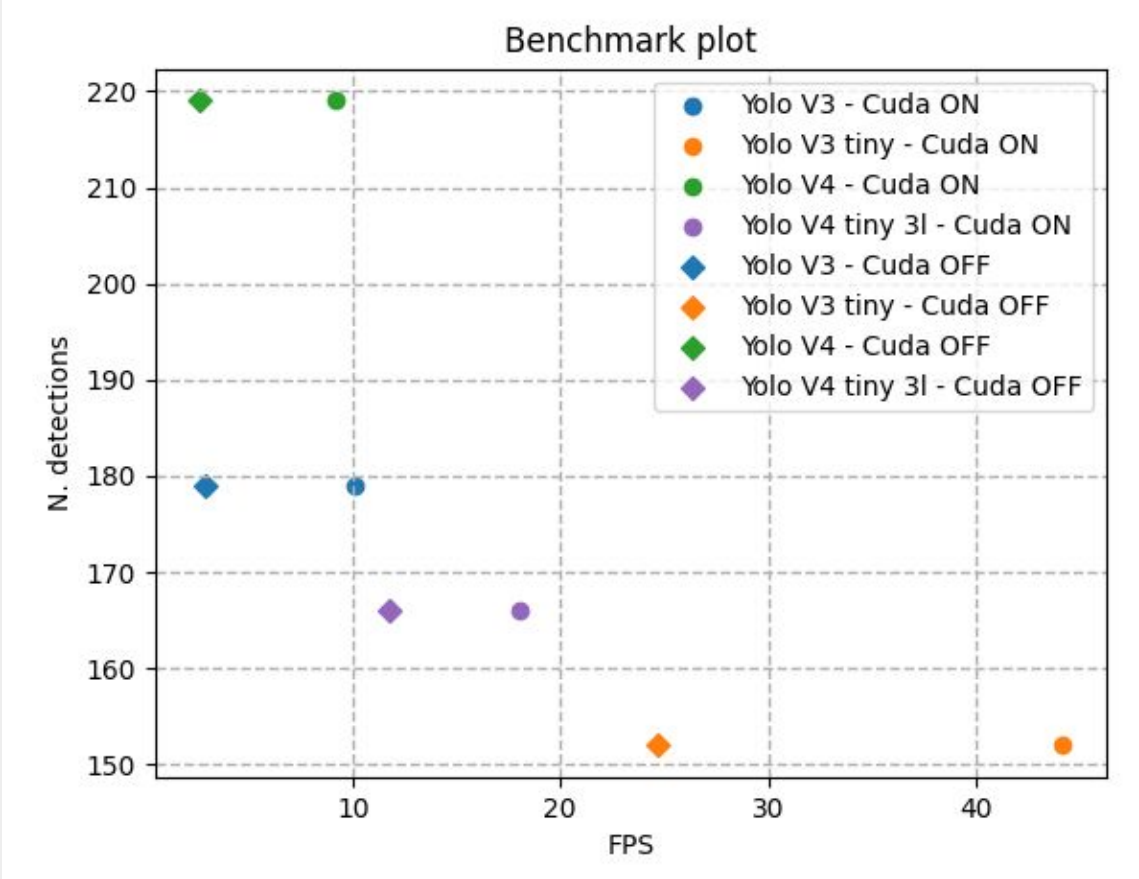


Lepton IR image (80x60, RGB, 3Bpp)

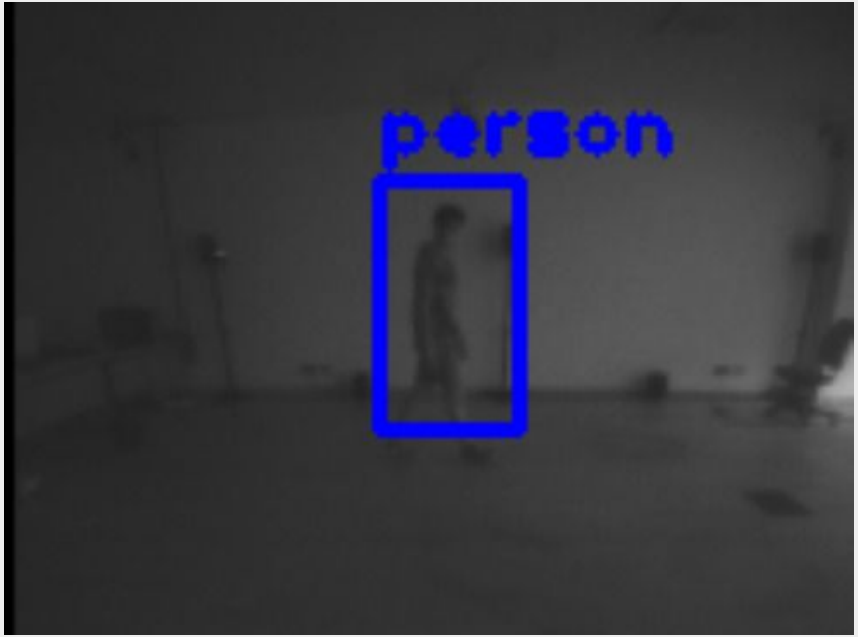
Himax visual image (160x120, Grayscale, 1Bpp)

People detector

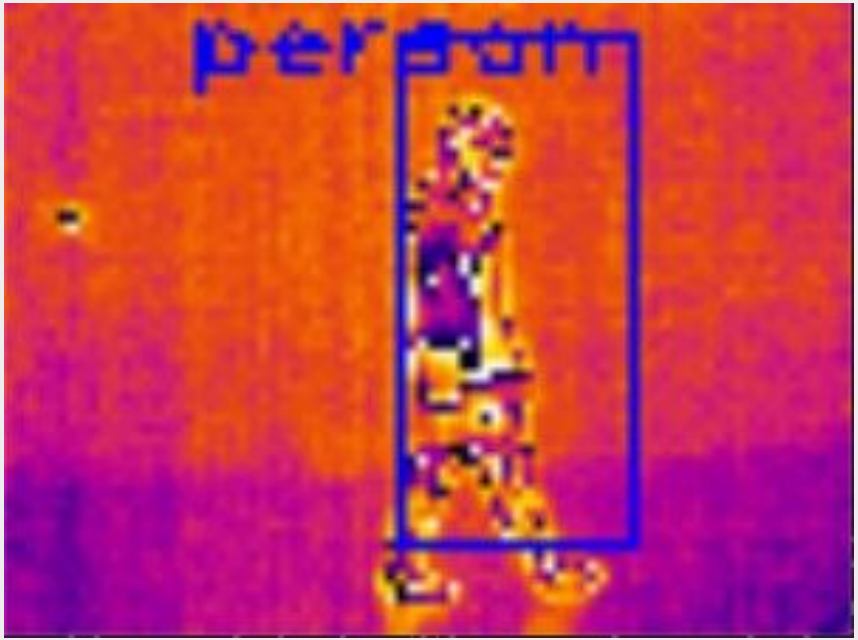
- **Best detection**
  Yolo v4
- **Fastest**
  Yolo tiny v3-3l
- **Best compromise**
  Yolo tiny v4-3l



Infrared dataset creation



Detection through YOLO network



Automatic labelling

Conclusions

- Realization of a low-cost, low-power **thermal scanner** prototype
- **Real-time tested** in a controlled environment
- Creation of a publicly available IR **dataset**
- Future work

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THANK YOU

FOR YOUR ATTENTION

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