

UiT

THE ARCTIC
UNIVERSITY
OF NORWAY

Thermal Drones Fighting Energy Loss

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Infrared Image Processing

- Capture thermal radiation (FLIR)
... visualise by mapping IR to visible light
- Interesting information without compromising privacy
- Open-source image processing software (OpenCV)
... classify object shapes even in low-res images

Counting people without identifying them



Building Inspection

- FLIR building photography
- Measuring actual physical properties
- Drones can easily capture large areas
- Off-the-shelf purpose built drones

City hall of Chicago - A warm city where vegetation can keep roofs cooler



Scaling Up!

Geef uw adres op: straatnaam gevolgd door huisnummer

Grote Markt 1

Zoeken



- Drones can easily cover a larger area
- Map of Bodø?
- Antwerpen:
Provides something like this as an on-line service
- Bodø: *Way* more interesting
... located within the arctic region
... heat loss an year-round issue (!)

Scaling Further! → Big Data

What if we **combine** IR imagery with other data sources?

Compositing: Combining elements from separate sources into one

Possible sources:

- Geolocation
- Maps
- Building standards (TEK07, TEK10, ...)
- Building properties (height, ...)
- Power distribution
- Water distribution

Interesting New Questions Arise

Hmm ...

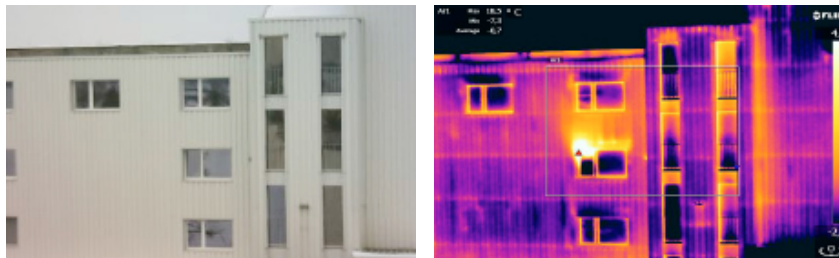
- Is TEK10 actually “better” than TEK07?
- How about retrofitting new technology? Tip: Check out the eLightHouse project!
- Where should we focus our efforts?
- Are we doing any obviously (alas, currently not so obviously) pointless things?
- Are we not doing some very useful things? **Why?**

Let me repeat that: **Why?**

... or, let me generalise: **Why** are we doing *whatever* we are doing?

Privacy Concerns

IR-light usually cannot pass through windows



- Sharing is generally desirable
... but anonymisation is necessary
- Even (or maybe especially) sharing some insights with municipality officials
could cause conflicts of interest
- Are there things you don't want to know?

Related research

A colleague did cluster analysis on power consumption data.

Strangely, some houses were classified as cottages. The opposite also happened for some instances.

Apparently, some cottages were used as permanent residences, while some houses (e.g. on earlier farms) weren't really used as primary residences.

Questions?

