

# FCAI Success Stories of AI

## Computer vision is guiding cranes

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# Computer Vision for cranes

- [FCAI Success story video](#)

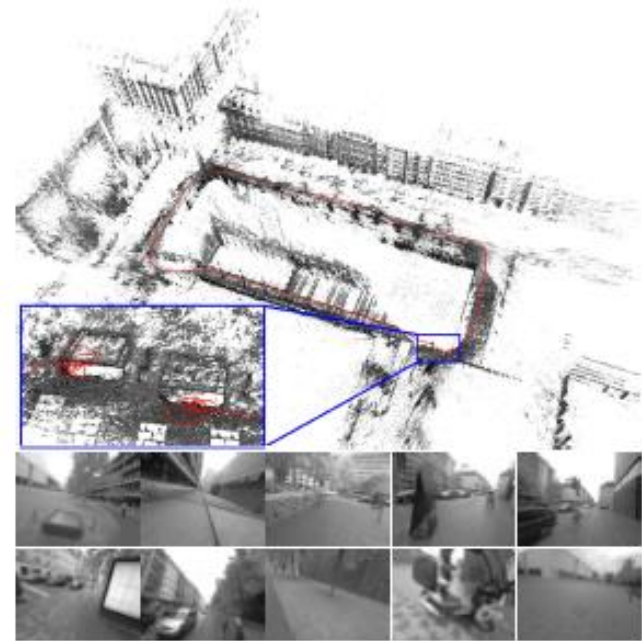
Photo: Konecranes



- Project funded by a donation from the Finnish company Konecranes
- Active collaboration with the company

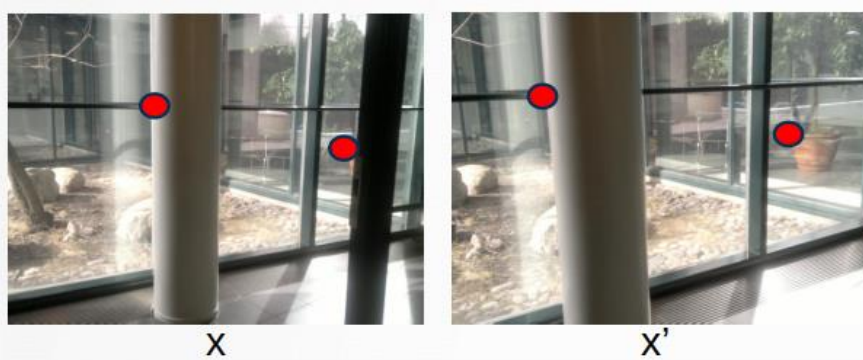
# Computer Vision methods

- **Simultaneous Localization and Mapping (SLAM)**
  - Domain specific challenges
  - Requirement for low-cost equipment
- **3D object understanding**



Engel et al. (2016). Direct Sparse Odometry

# Localization and challenges



Changes in images may be converted into changes of the camera location



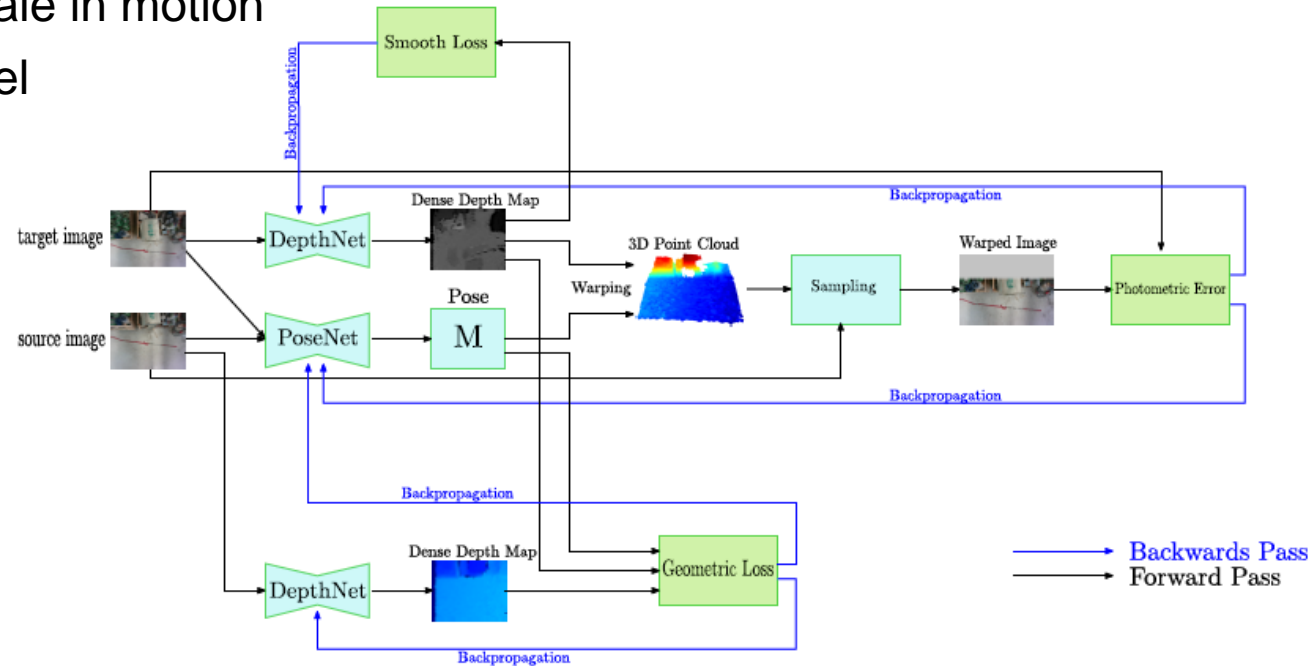
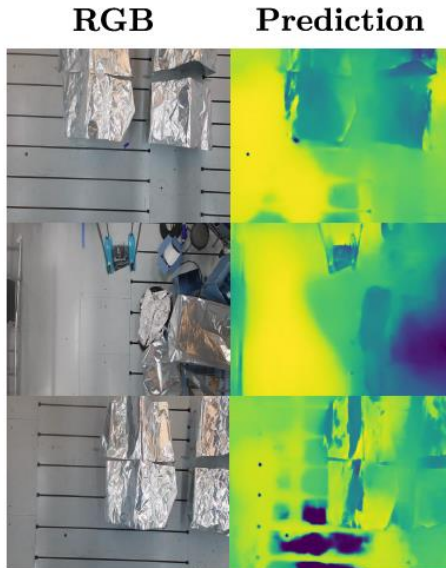
Featureless surfaces



Shiny (non-lambertian) surfaces

# Depth issue

- With monocular camera it is not possible to know the depth of objects
  - Unambiguous scale in motion
- Deep learning model learns the depth



# Reliable Perception

## 3D Object Understanding

- What are the objects in the area and where are they wrt the observer
- Object detection, tracking, pose estimation, scene reconstruction, ...
- Atypical perspectives complicate the situation even more



Shutterstock



Leinonen M. (2021), Monocular 3D Object Detection And Tracking in Industrial Settings, MSc thesis