

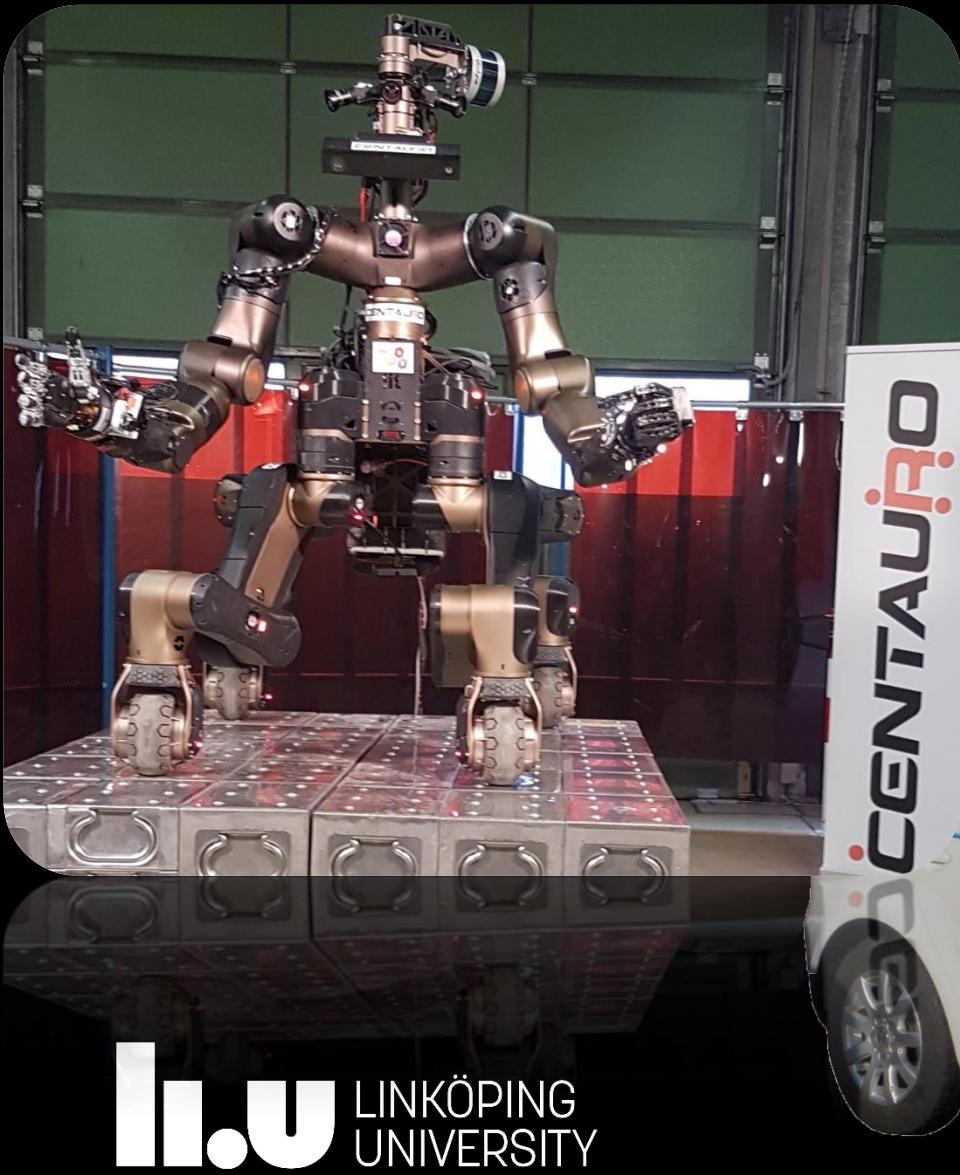
AI and Robot Vision for Disaster Relief

Michael Felsberg

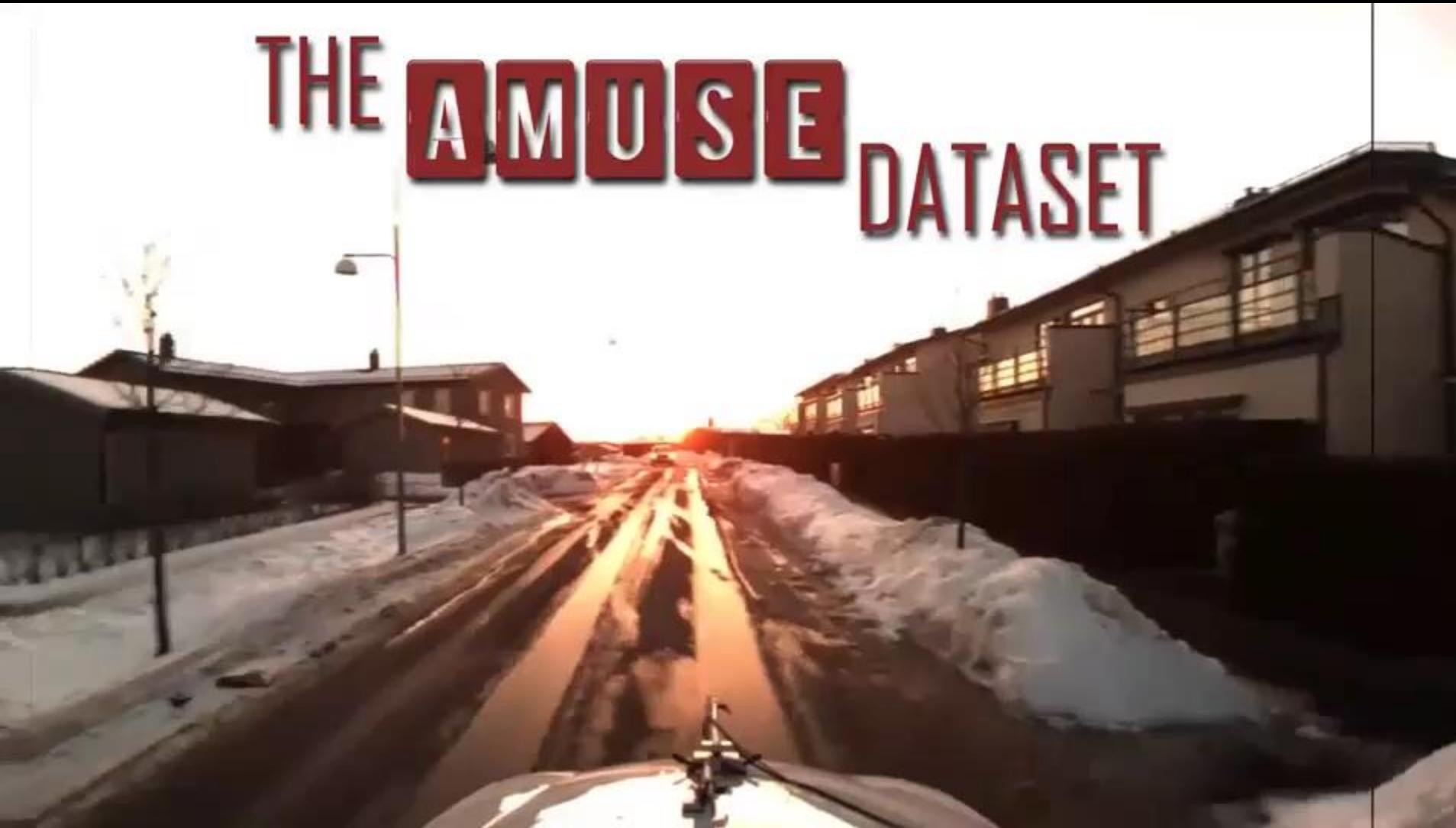
Computer Vision Laboratory
Department of Electrical Engineering
Linköping University

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Platforms: Vehicles & Robots



360 view



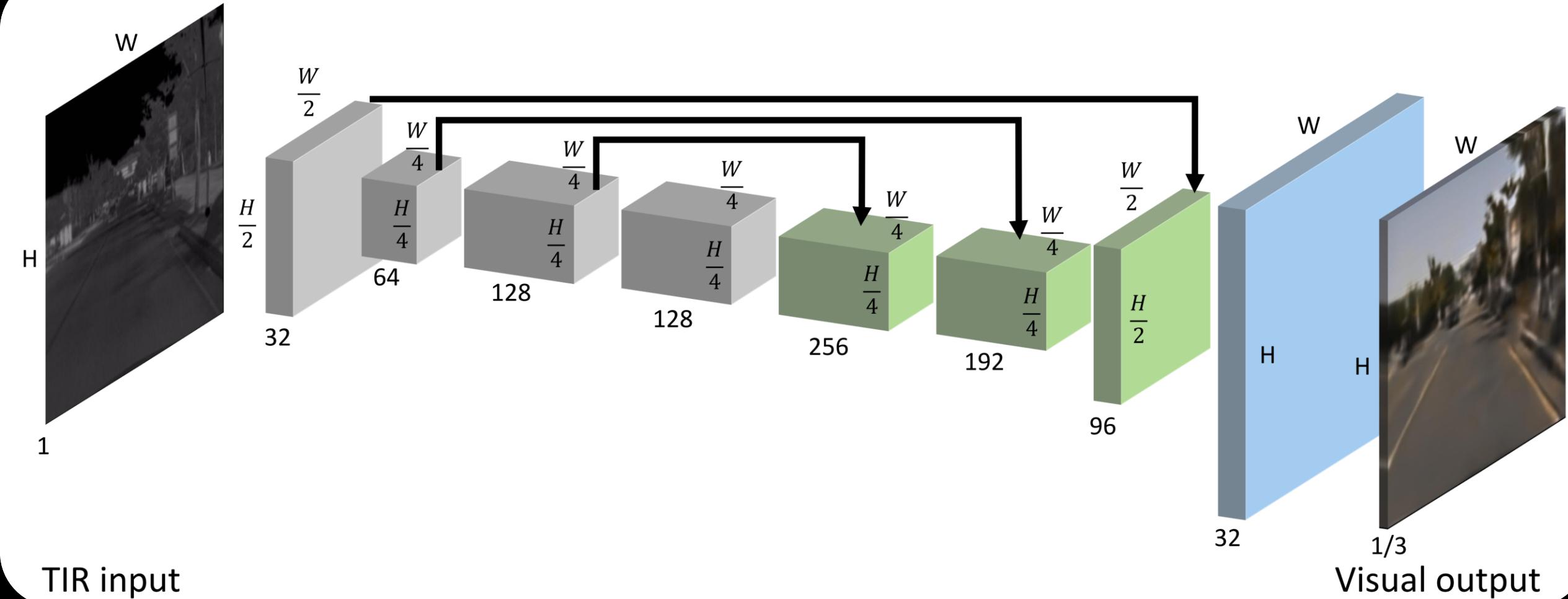
LINKÖPING
UNIVERSITY

[Koschorrek et al., CVPRWS2013]

What do You see?



NaTIRal Transformation



TIR input

[Berg et al., CVPRWS2018]

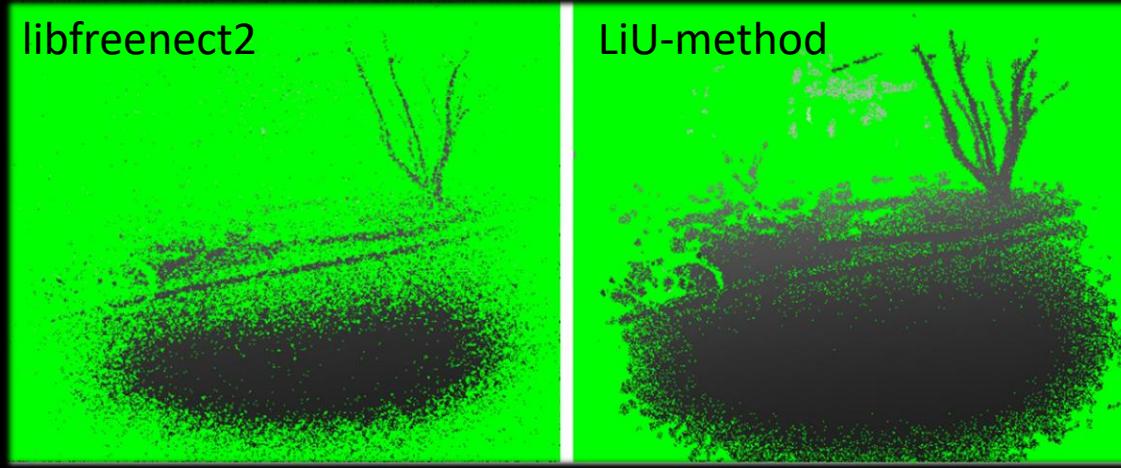
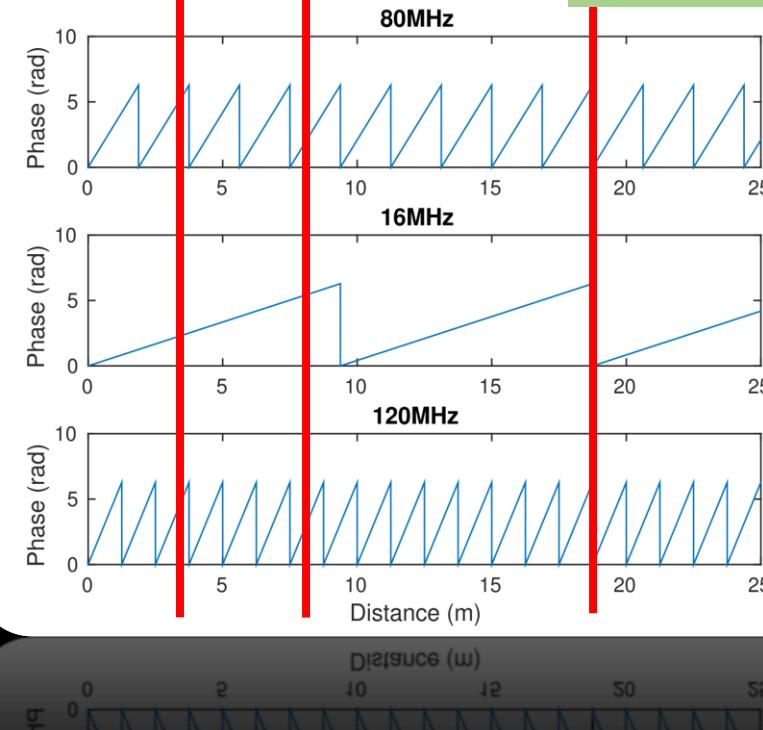
Kinect 2 extended



Libfreenect2: 4.5
m limit

Microsoft SDK: 8
m limit

Theoretical limit:
18 m



[Järemo Lawin
et al., ECCV2016]

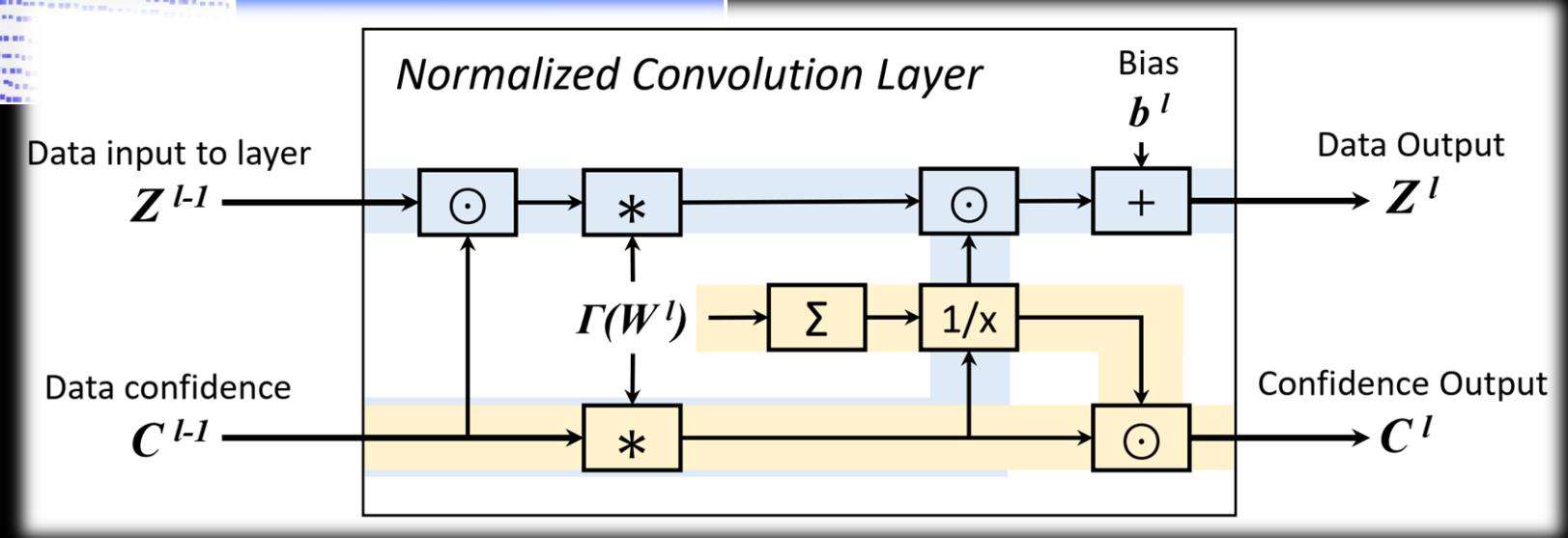


Deep Learning with Depth Data

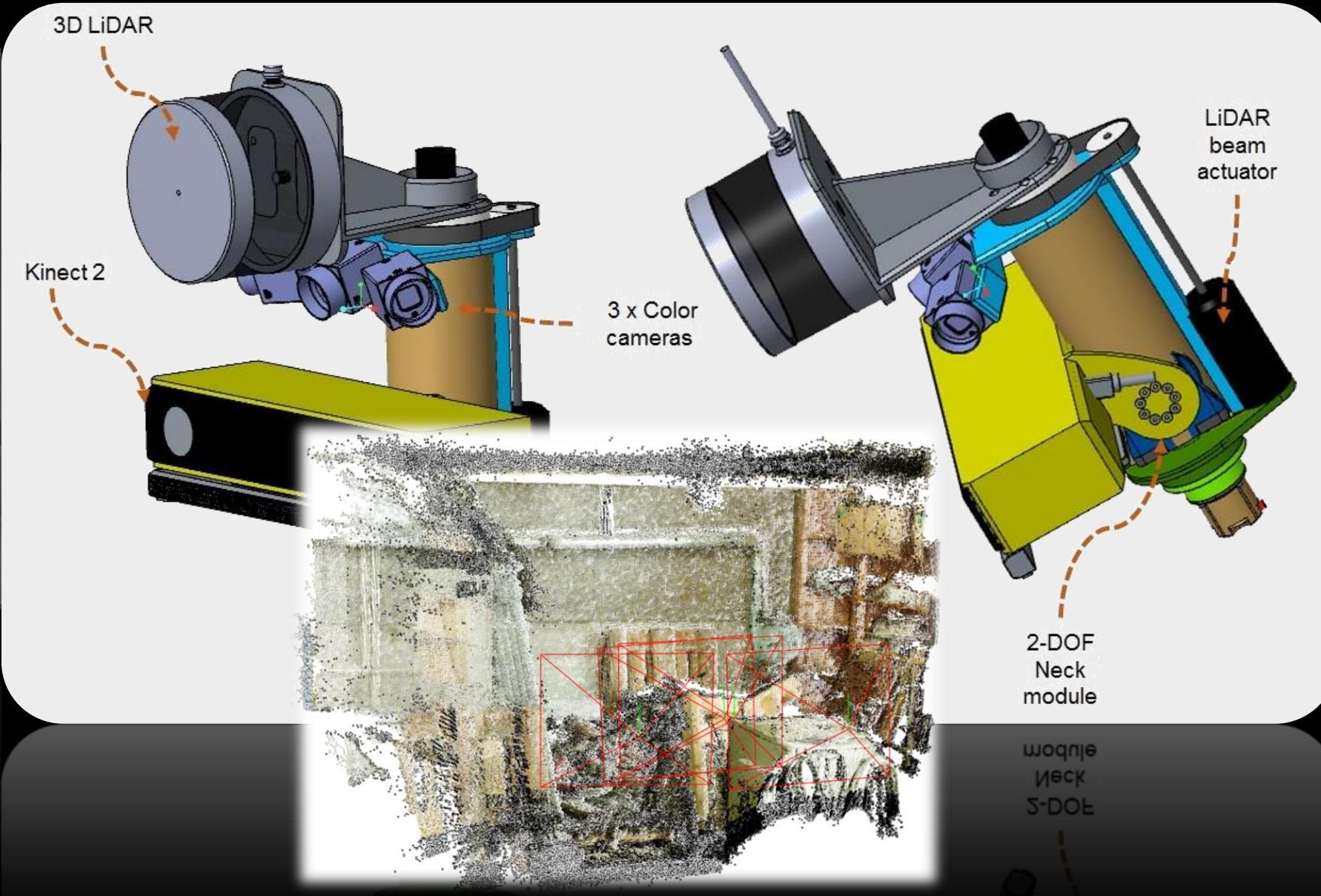
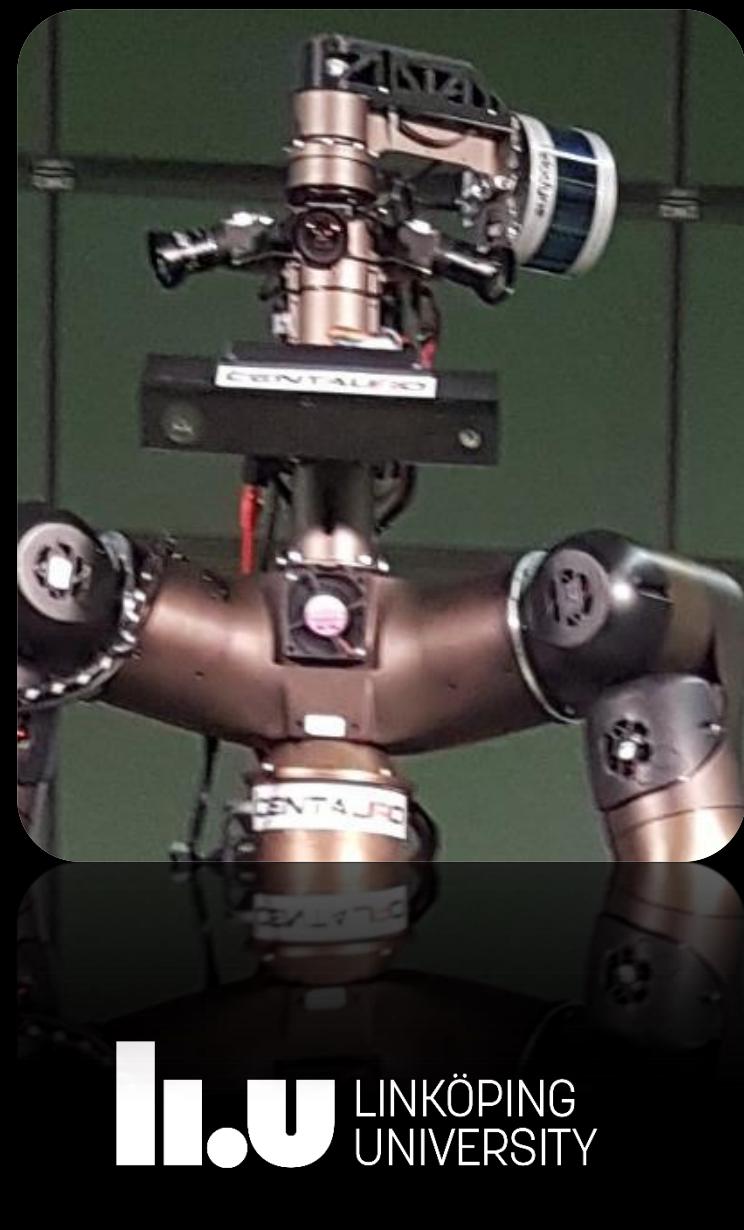
- measured data is sparse and contains outliers or missing data



[Eldesokey et al., BMVC2018]



Multi-sensor setups: CENTAURO



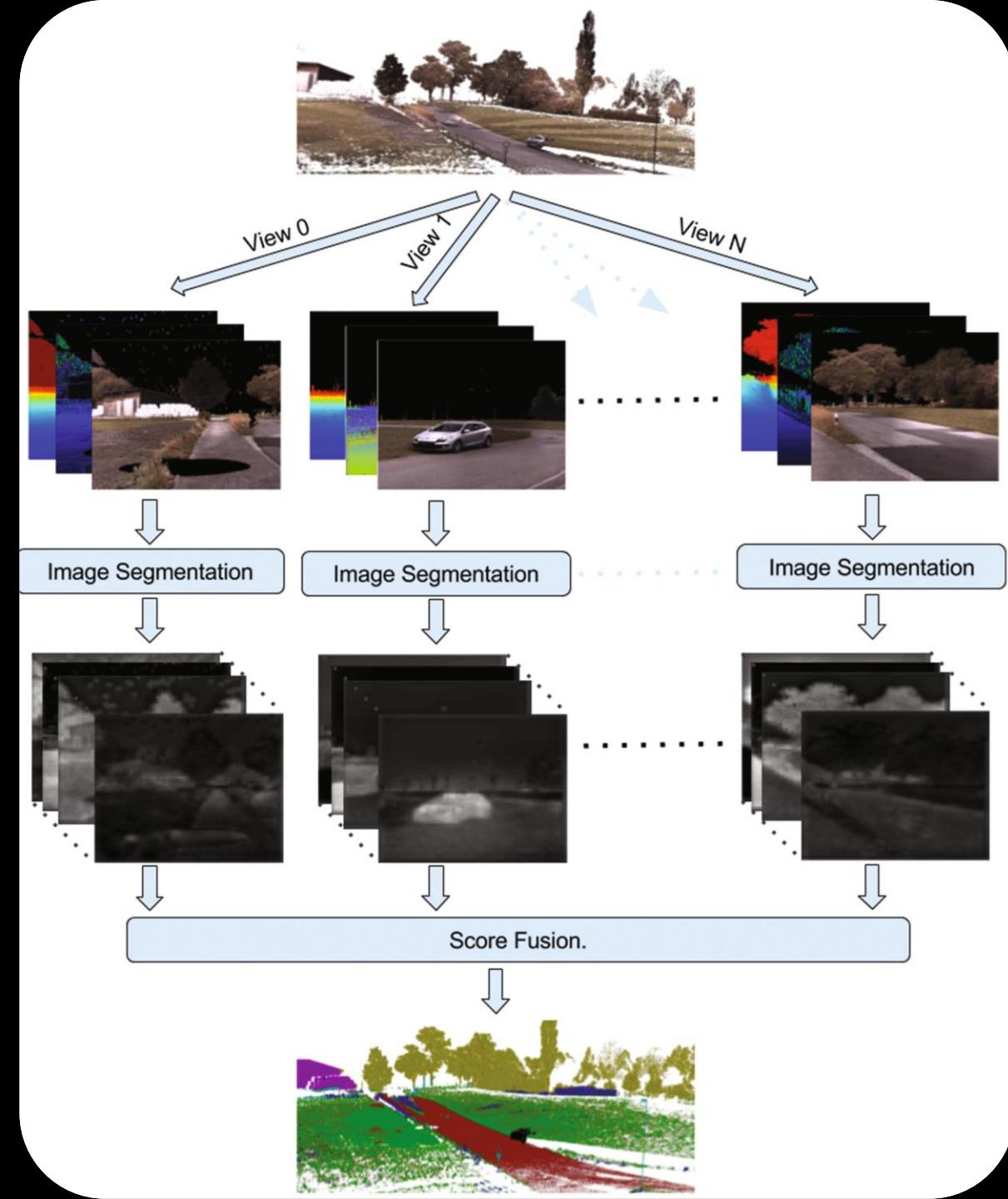
Point cloud registration



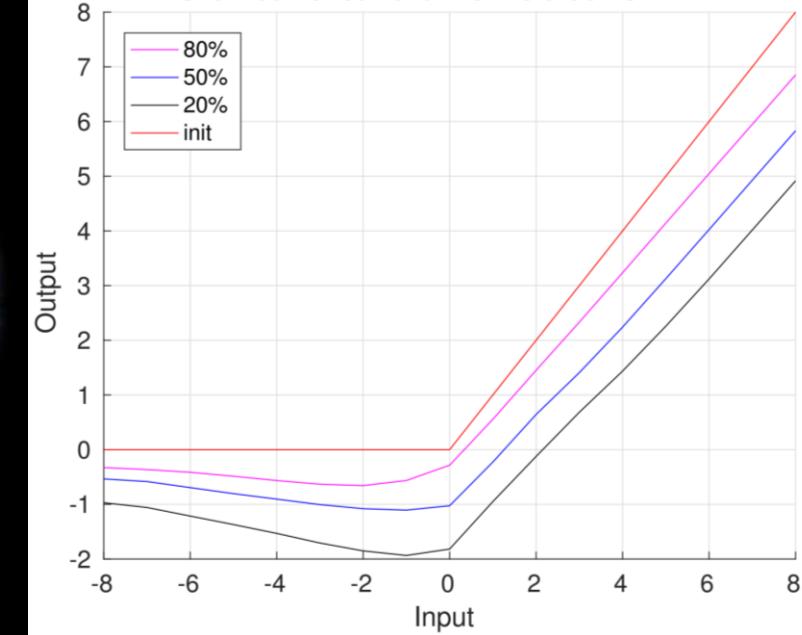
[Danelljan et al.,
CVPR2016, ICPR2016]
[Järemo Lawin et al., CVPR2018]

3D Segmentation

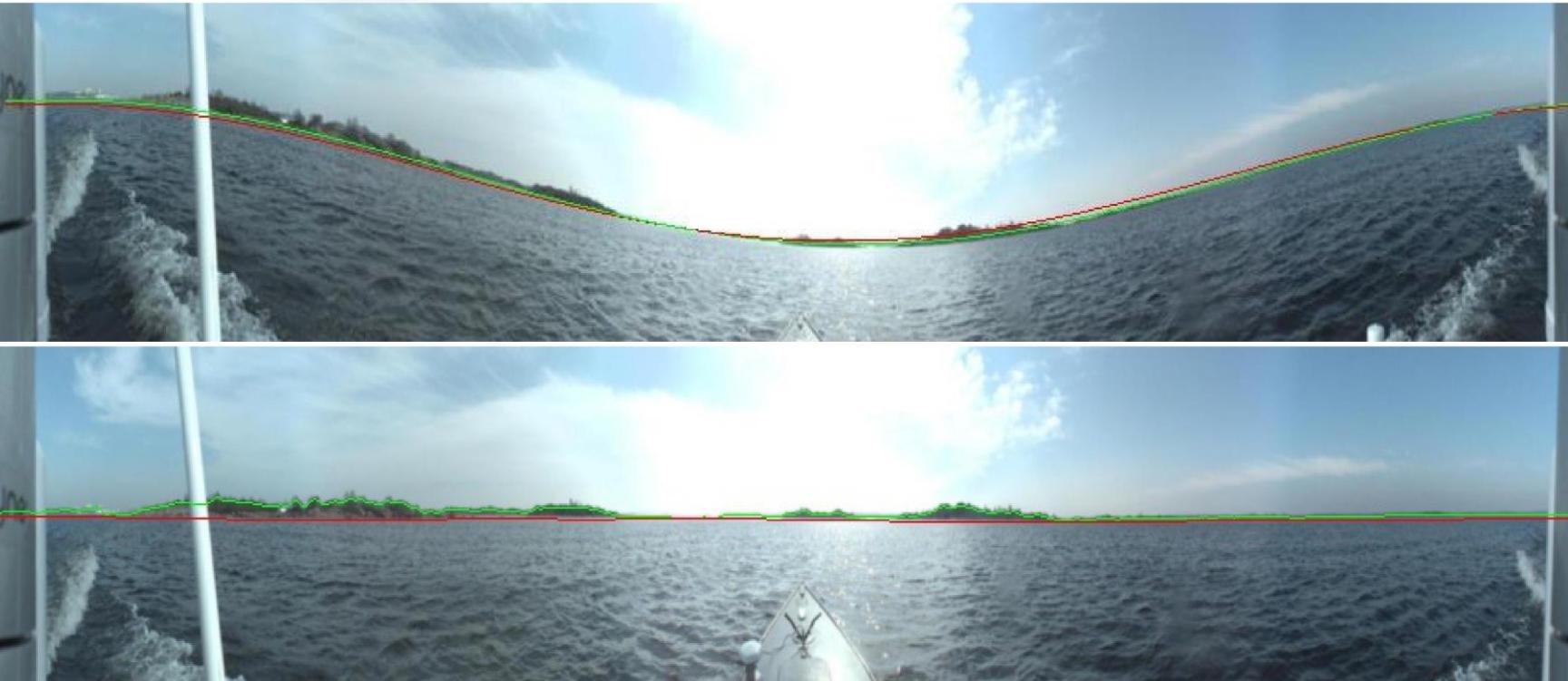
[Järemo Lawin et al., CAIP2017]



Cifar100 Lenet Pchannel Relu 8bins



[Grelsson et al., ICPR2018]
[Grelsson et al., IPAS2018]



Drone controlled by visual tracking

External view



Mission element:

Tablet UI view



Tablet UI interaction:

Starting vision-based leashing

UAV view



Conclusion and acknowledgements

- One of the most underestimated problems in engineering and computer science
 - MIT CSAIL 1966: *"The summer vision project is an attempt to use our summer workers effectively in the construction of a significant part of a visual system."*
- Thanks to my team at CVL, in particular Martin, Goutam, and Fahad!
- Acknowledgements
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 - H2020 CENTAURO