Online large-scale SLAM with stereo visual-inertial sensors

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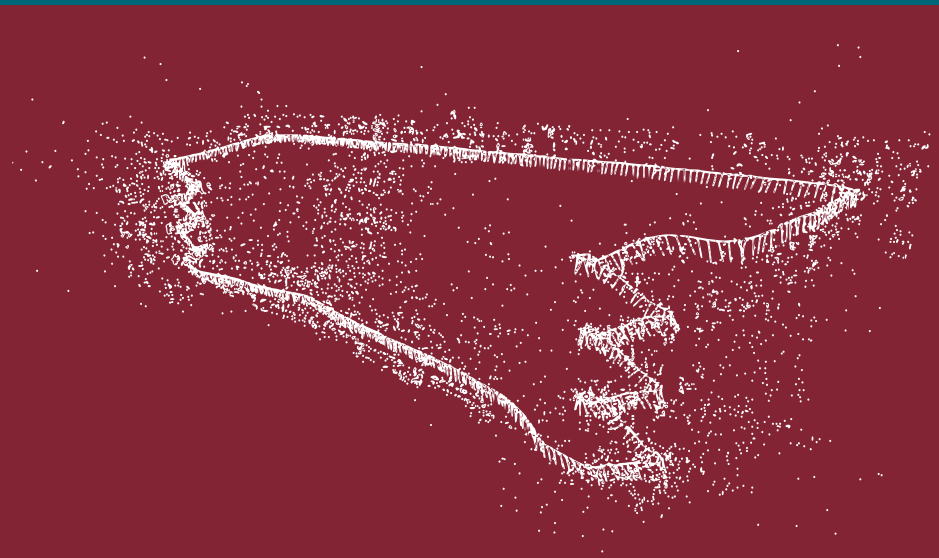

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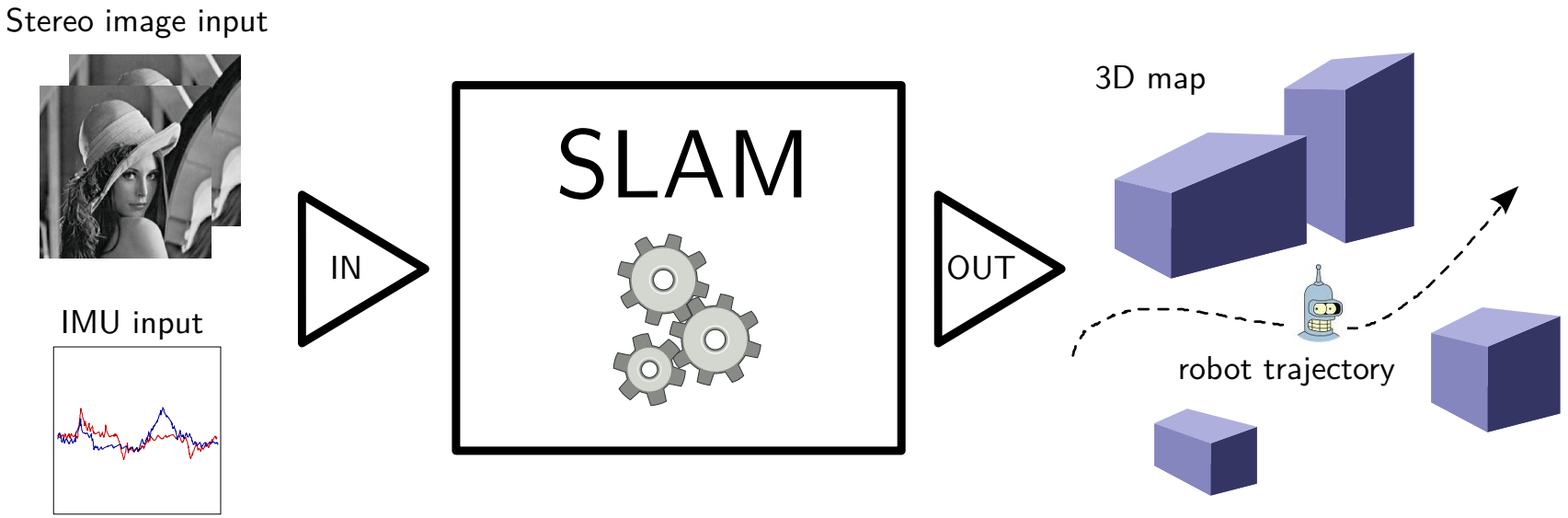
Our mission



Required capabilities:

- Tracking (Odometry, Optimization, Landmark generation)
- Local mapping (Key frame generation, Loop closing)
- Global mapping (Solving of SLAM problem)

Related work and state of the art

Google (street) mapping:

Car

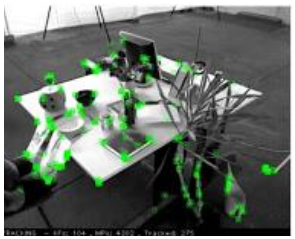
Trekker

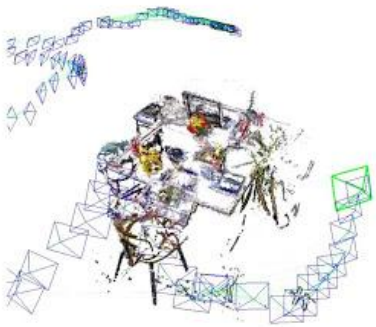
Trolley

Snow mobile

Trike

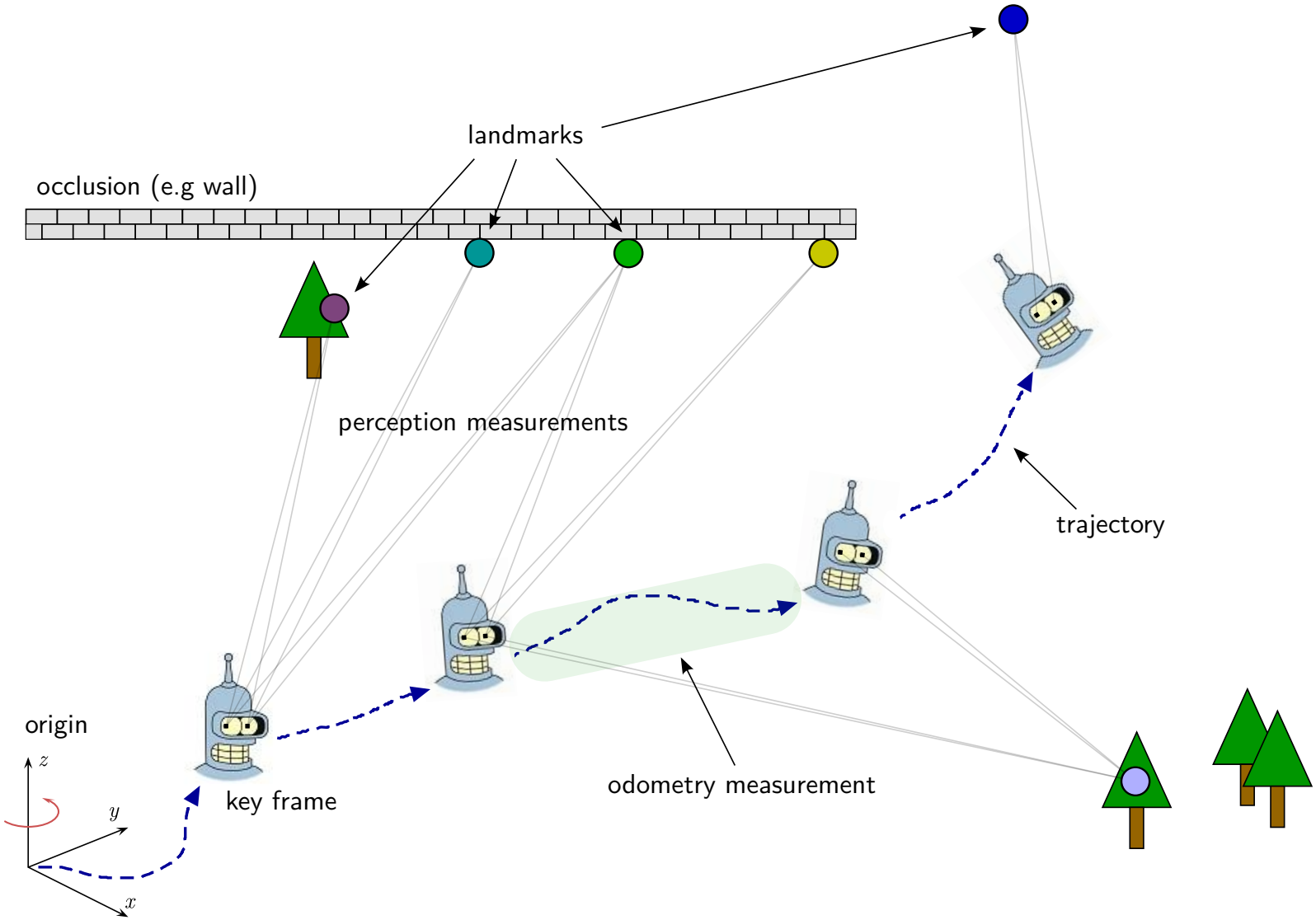
ORB-SLAM (Mur-Artal et al):



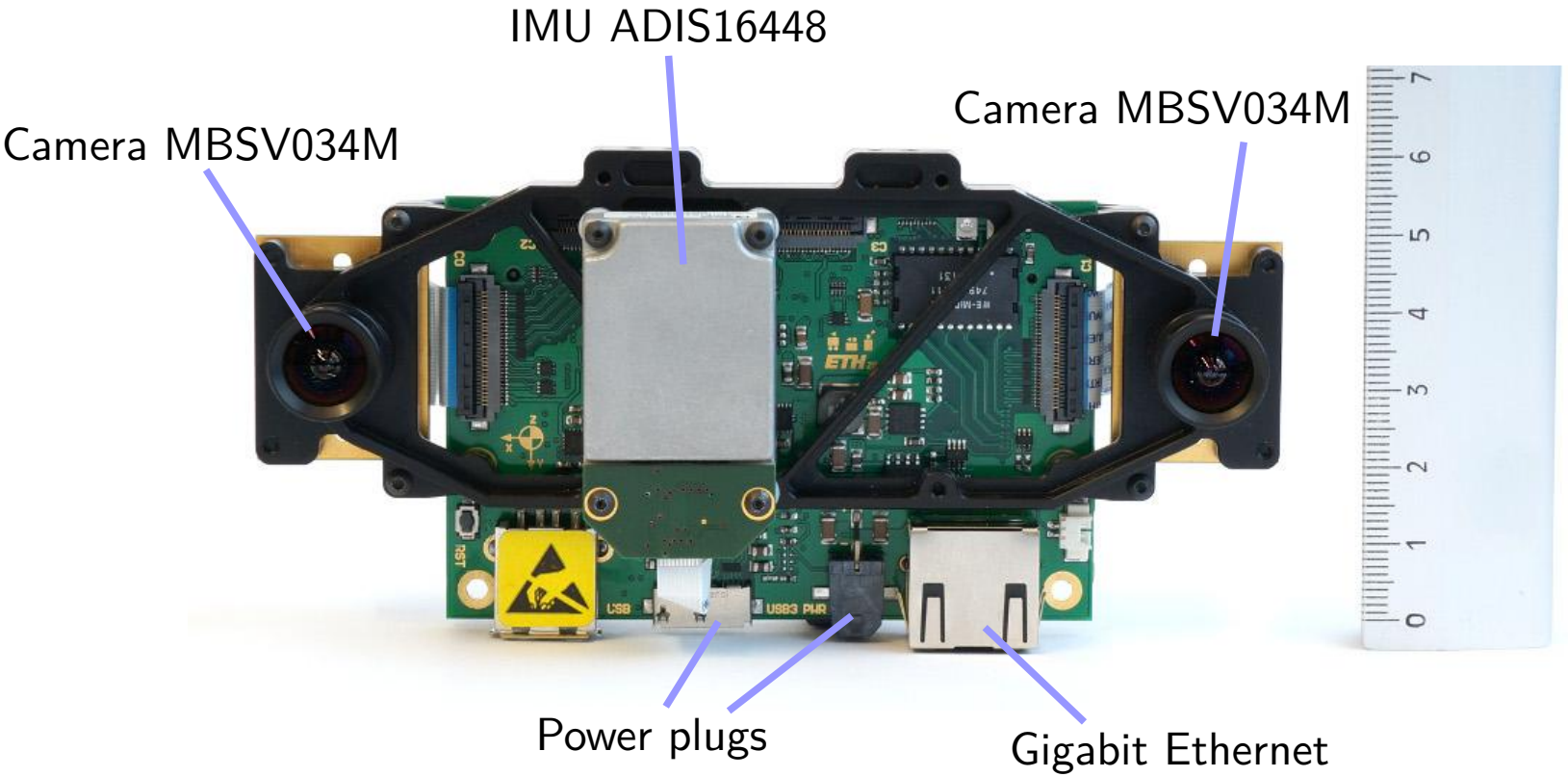


ROVINA (Grisetti et al):

Graph-based SLAM



Sensor setup: the VI-Sensor



First steps

Least squares optimization

g2o

Pipeline

System in action

Hand-held dataset: Aula magna
Bike mounted dataset: Streets in San Lorenzo

Results: hand-held

Results: bike mounted

Results: KITTI

Conclusions and final remarks

Future work