



The Car of the Future

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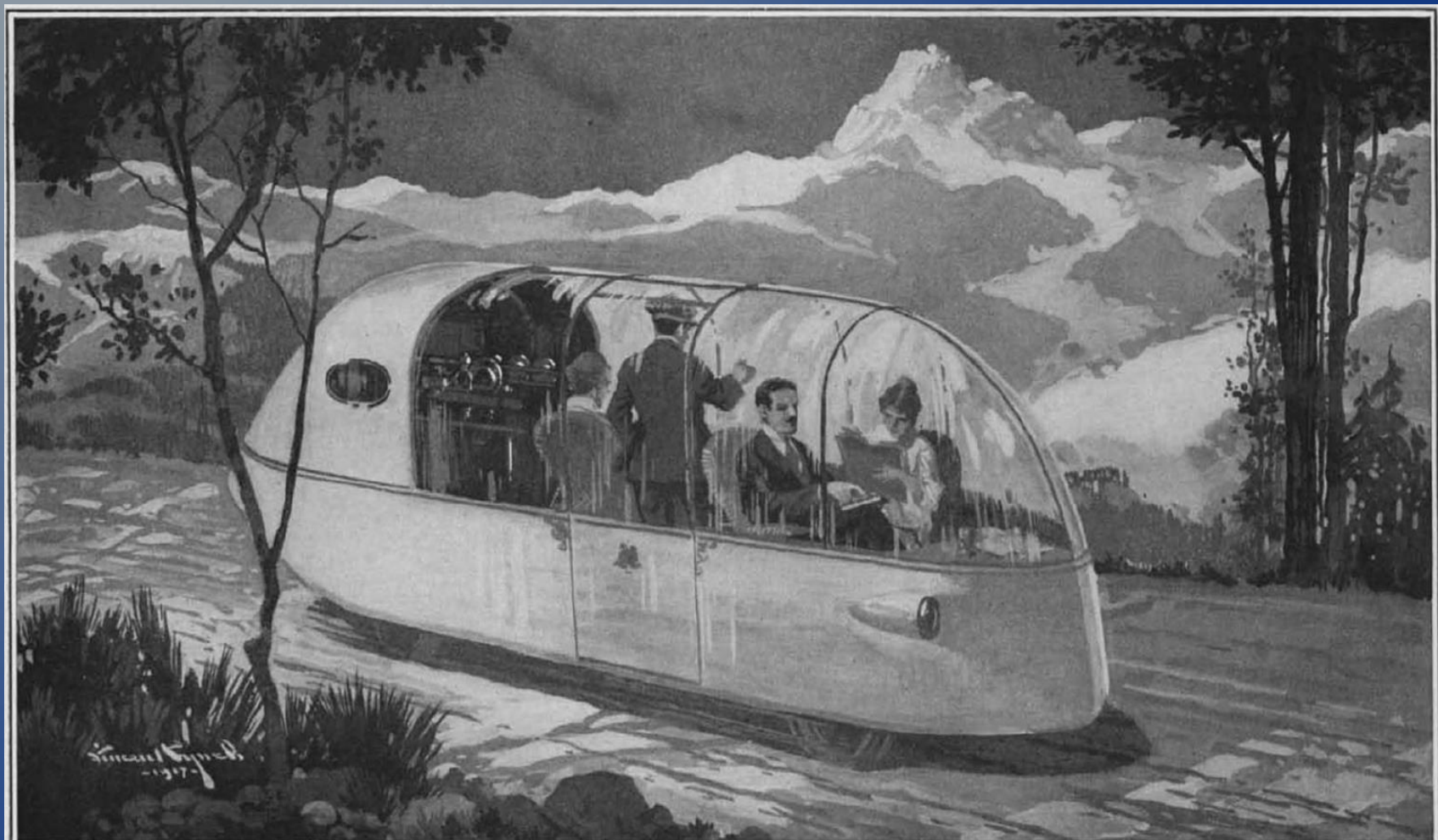
Fachbereich Mathematik und Informatik

Dahlem Center for Intelligent Systems

Mexico City



1918: dream the future



The future of transportation



German/Swedish car industry

- **Volkswagen**: lane assistant ready 2016
- **Daimler**: autonomous drive 2013, highway assistant 2016, highly-automated driving (HAD) 2020
- **BMW**: Demo Germany-Italy in 2014
- **Audi**: Laser scanner for HAD 2016
- **Continental**: HAD 2020
- **Bosch**: developing HAD
- **Volvo**: 100 autonomous cars in 2016/17



URBAN CHALLENGE

2007 DARPA Urban Challenge Semifinalist Teams



36 Teams

Team Berlin (FU Berlin)



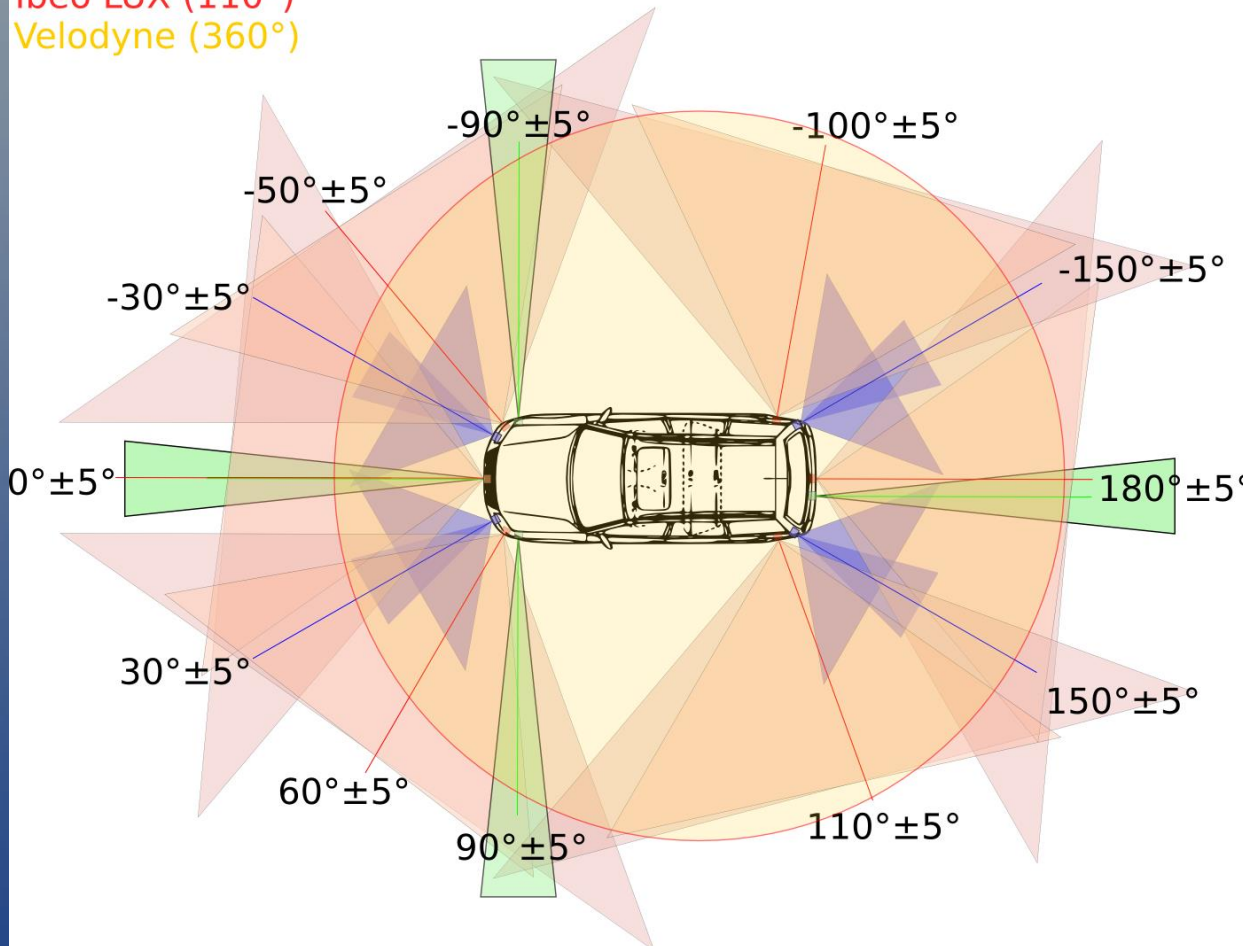
MadeInGermany



Sensors in MadeInGermany

Legende:

Wide-Range RADAR (12°)
Short-Range RADAR (100°)
Ibeo LUX (110°)
Velodyne (360°)



Data fusion
for very fast
data streams

Heterogeneous
sources of data

Electronics in the trunk

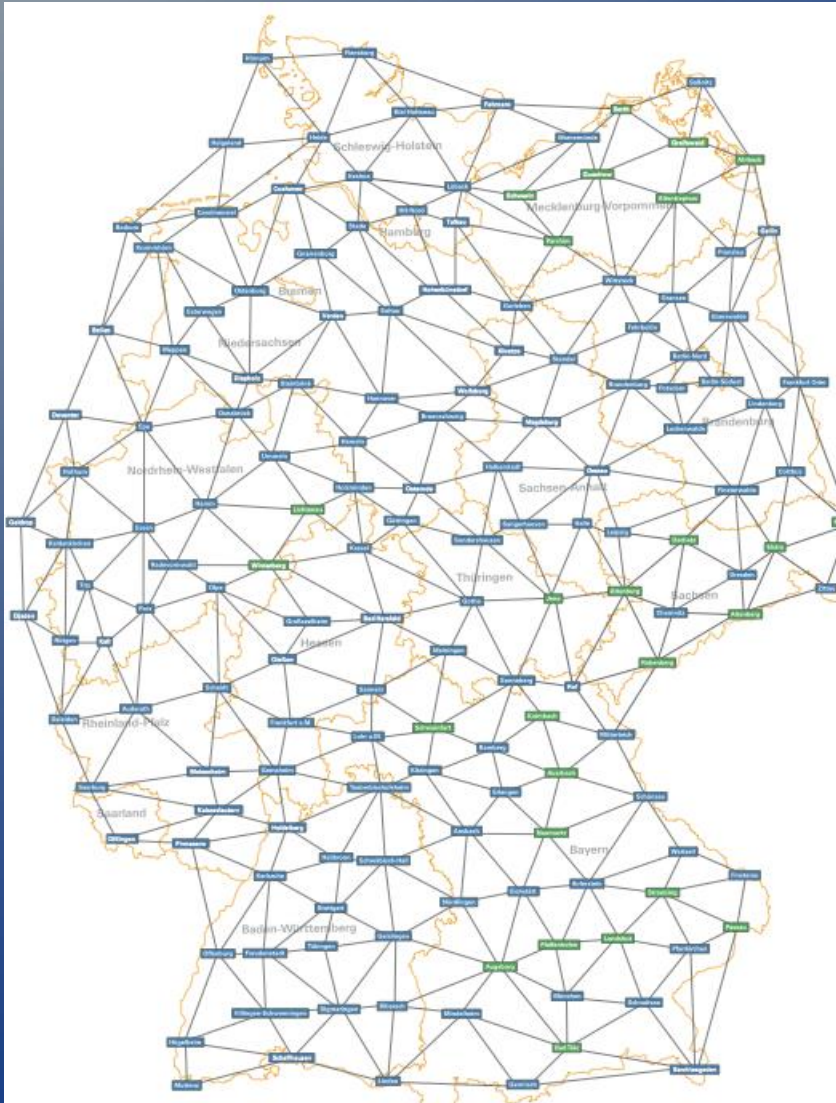


Hierarchy of
embedded
processors

iPad Remote Control



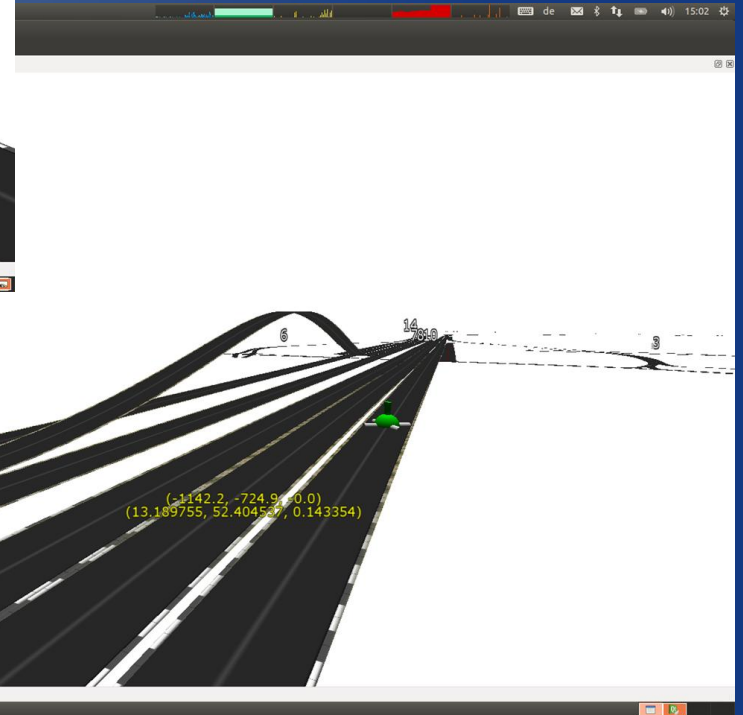
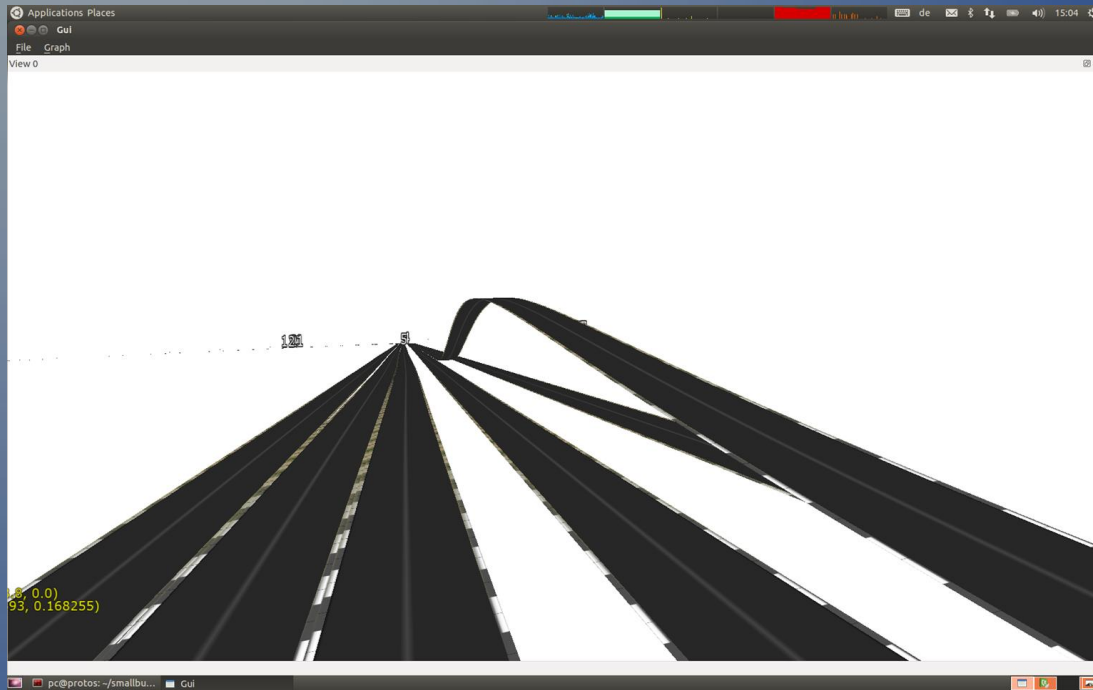
Differential GPS in Germany



Optimal localization
with cheaper GPS
systems:

Inference in graphs

The map has three dimensions

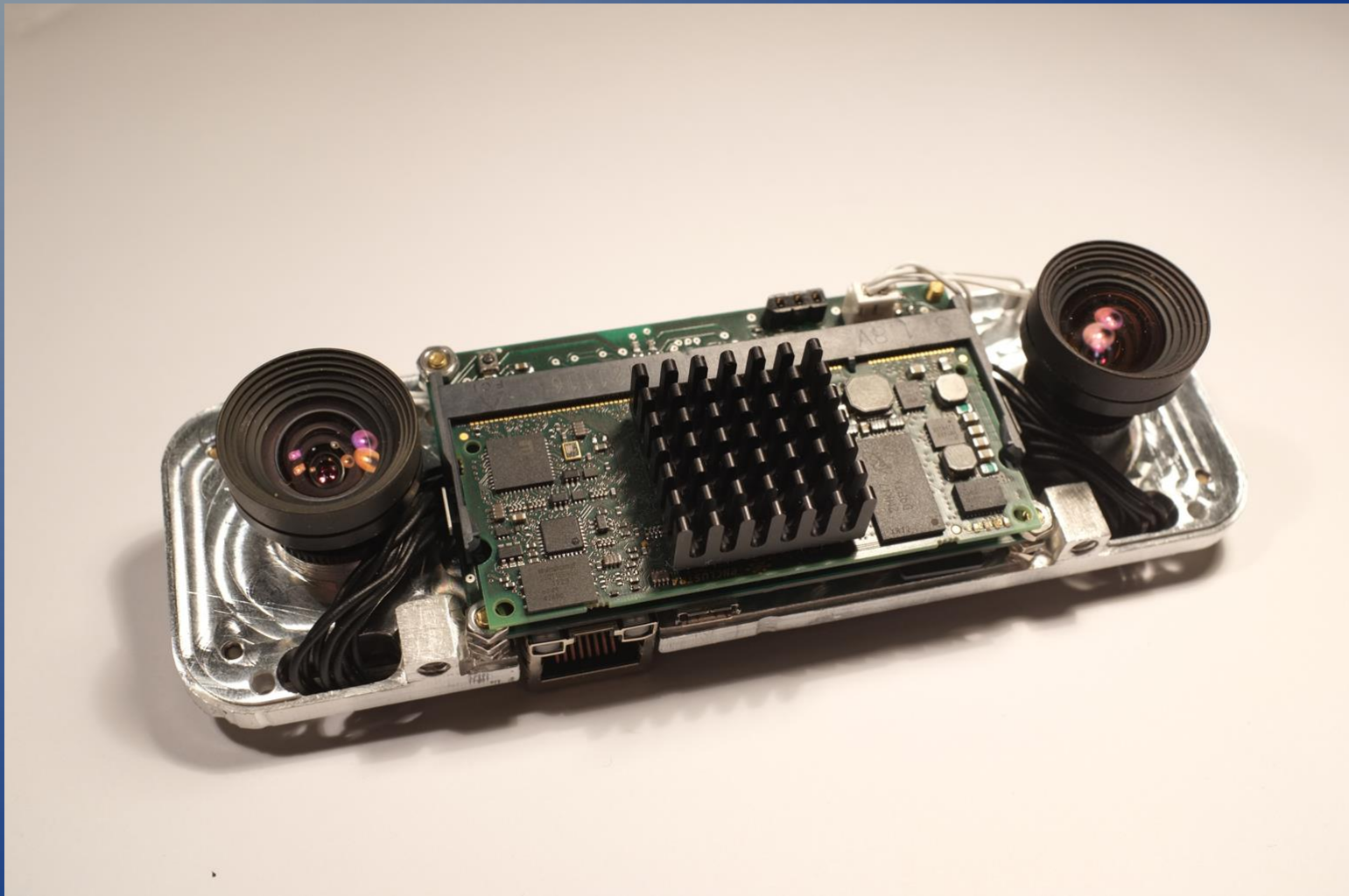


Interior / Front Cameras



Our automotive stereo system

Dynamic Programming on-chip



Now installed in trucks



The three factors for the future

- Intention recognition
- Telecommunications
 - Car-to-Human
 - Car-to-Car
- Computer Vision
- Ultraprecise, ultracheap positioning
- Swarm behavior

Intention Recognition

- The most difficult part: recognizing intentions of other drivers



Car to Car Communication Consortium



