

V-CHARGE

Automated Valet Parking and Charging for e-Mobility

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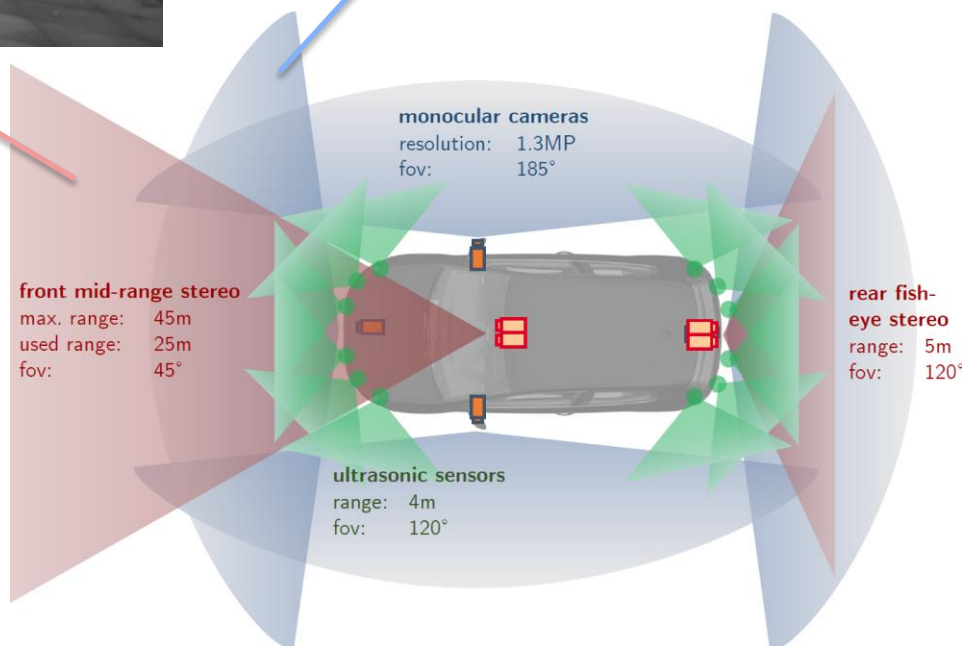
Project Goals

- Automated valet parking and charging
 - no time-consuming search for parking spots any more
 - driverless valet service
 - no human intervention
- Fully automated driving
 - in mixed-traffic scenarios
 - in indoor and outdoor parking lots and parking garages

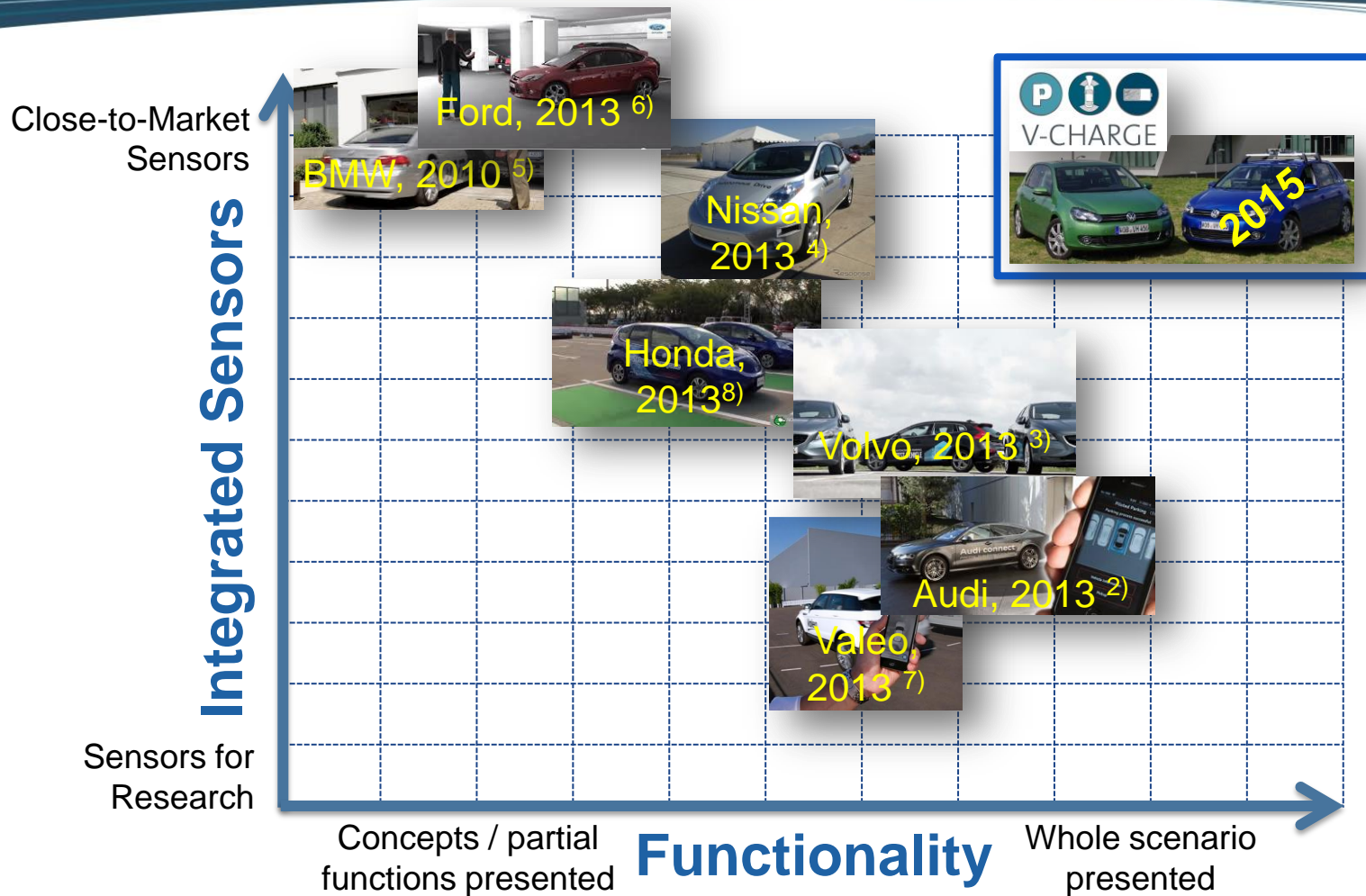


Project Goals

Close-to-series low-cost sensors only for nearby market adoption

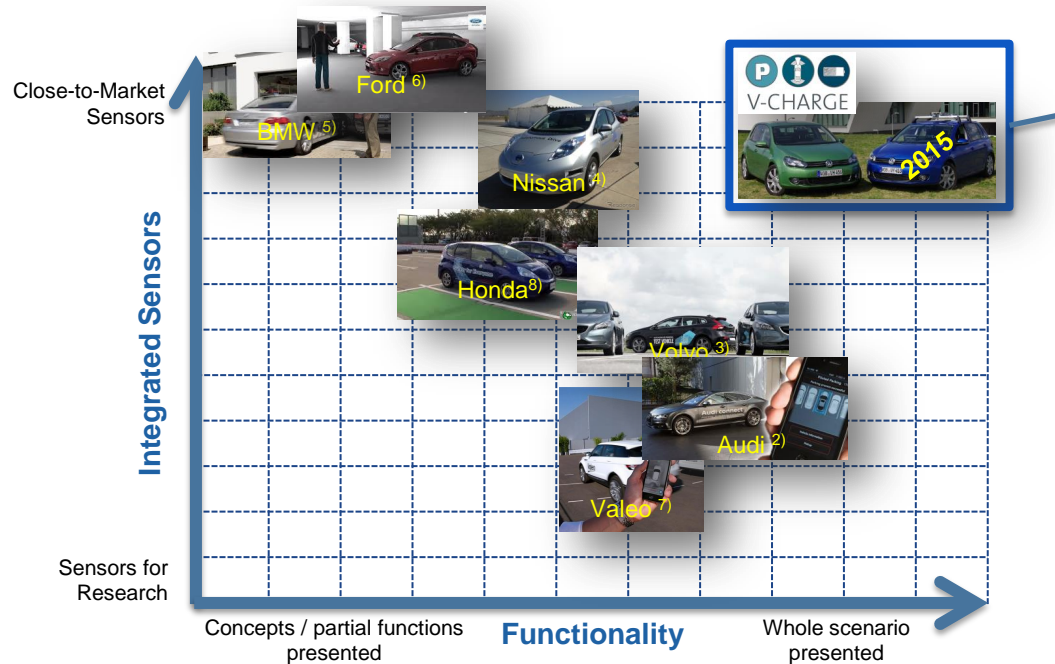


Our Competitors



- 1) http://www.dlr.de/dlr/presse/en/desktopdefault.aspx/tabid-10310/473_read-6186/year-all/#gallery/8722
- 2) <http://www.welldonestuff.com/2013/01/audis-self-parking-car.html>
- 3) <http://www.autoblog.com/2013/06/20/volvo-demos-autonomous-self-parking-car-concept/>
- 4) <http://nissannews.com/en-CA/nissan/canada/videos/nissan-autonomous-drive-remote-parking>
- 5) <http://www.bmwblog.com/2010/10/10/bmw-remote-controlled-parking/>
- 6) <http://www.autoblog.com/2013/10/09/ford-fully-automated-self-parking-car-video/>
- 7) http://www.valeoservice.com/html/egypt/en/products.focusdetail-valet_park4u%C2%AE_the_automated_parking_system-678248713529DA1BBB3A7C.html
- 8) <http://www.autoblog.com/2013/10/26/honda-autonomous-valet-parking-system-video/>

Our Competitors



- More versatile functionality with cheaper and closer-to-series sensor setup
- Minimal infrastructure on parking lot side
 - Car(s) map parking lot itself
 - No artificial landmarks required



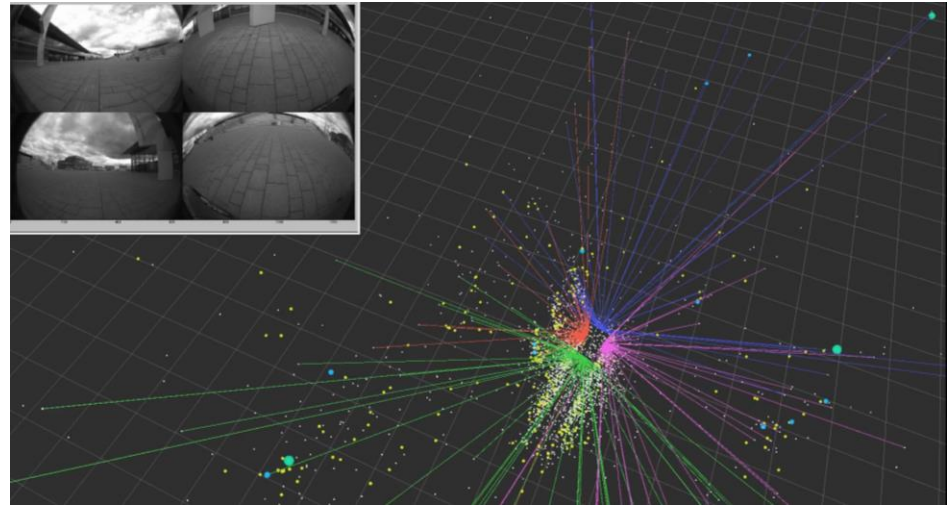
Project Results

- **Stable, highly-accurate camera-only localization system**
- Reliable camera-only low-speed navigation in static environments
- Promising results for mixed-traffic navigation
- Fully automated parking procedure
- V2I parking lot communication
- Object detection from multiple wide-angle fish-eye monocular cameras
- Automated semantic annotation of parking lot map
- And many more ...



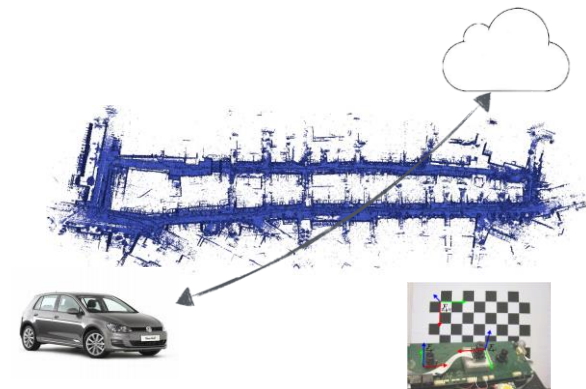
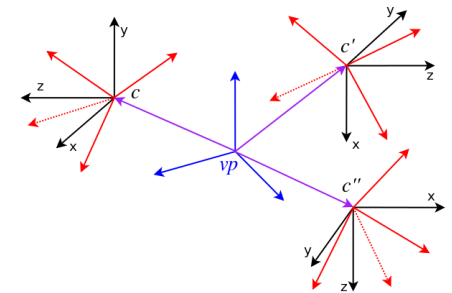
Project Results

- Stable, highly-accurate camera-only localization system
- Quantifiable performance → interesting for industry
- Potential markets
 - autonomous driving
 - trained parking
 - inspection
 - logistics
 - indoor navigation with smartphones
 - location-based services



Project Contributions

- Release of open-source software
 - **OpenGV**: An efficient open source library for
 - Calibrated geometric vision problems
 - Unconventional camera systems
 - State-of-the-art algorithms
 - **CamOdoCal**: Automatic Intrinsic and Extrinsic Calibration of a Rig with Multiple Generic Cameras and Odometry
 - Ready-to-use calibration pipeline for multi-camera systems



→ Leverages future research and product development

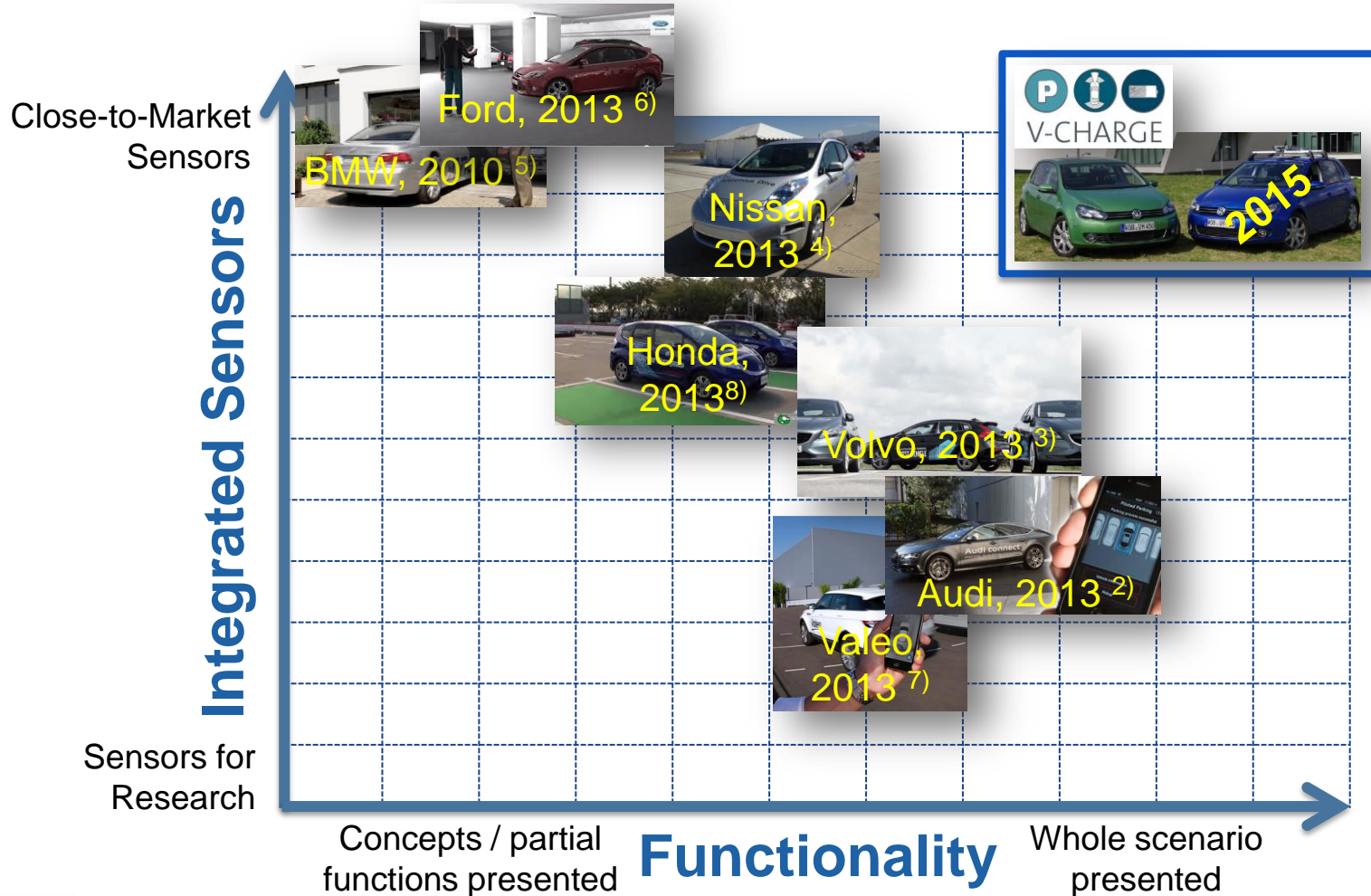


Project Contributions

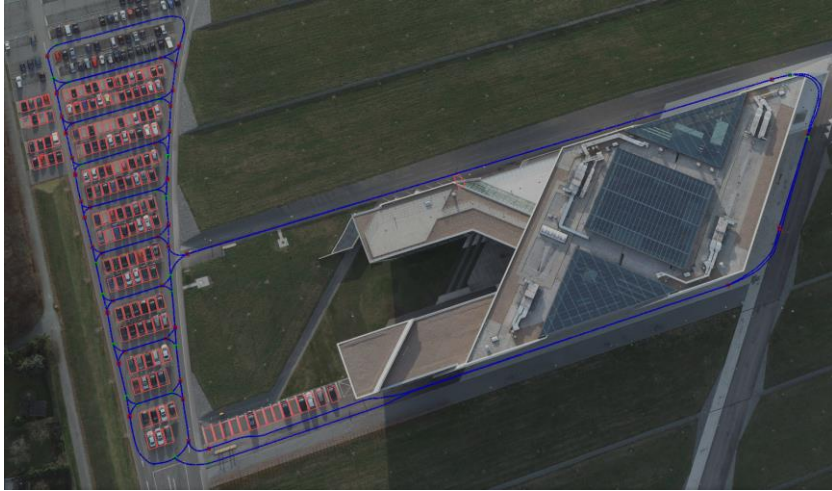
- ZurichEye =  + 
V-CHARGE Project Tango
- Project within the Wyss-Zurich Center for Technology Transfer
 - Accelerate development of products and innovations
- The goal is to provide high precision, low latency localization for industrial and research applications
- ETH and UZH together work on transferring this technology to the market in the short term



The User Aspect



Thank you for your attention



V-Charge final project demonstration

- 25th/26th of June, 2015
- Mobile Life Campus, Wolfsburg

