We explore, evaluate and transfer cutting edge technologies primarily from non-automotive US industries to our partners within the BMW Group.

- Continuous technology exploration
- Identifying upcoming trends
- Study, evaluate, and apply technology
- Building prototypes for proof of feasibility
- Developing promising innovations into products
- Technology transfer

We contribute successfully with innovative solutions to the major challenges BMW Group is facing currently and in the near future.
MOBILE SENSOR SERVICE CHALLENGE

BMW Vehicle with rich sensor data + Connectivity and Cloud Computing Ecosystem = Value Added Services and New business models

Smart re-fueling + Social networks + Predictive energy management + Improved map data + In-car entertainment

How can BMW realize the value of vehicle sensor data?
A MODERN BMW SENSOR PLATFORM
(EXAMPLES)

- Seat occupancy and child seat detection
- Crash sensors, voice and data modem
- Machine vision camera, rain & light sensor
- Ultrasound sensors and cameras (7)
- Radar based blind spot detection
- Wheel sensors for precise dead-reckoning
- System health monitoring
- Speed, temperature & fuel level sensors
- Night vision with pedestrian detection
- Crash sensors, voice and data modem
- Machine vision camera, rain & light sensor
- Ultrasound sensors and cameras (7)
- Radar based blind spot detection
- Wheel sensors for precise dead-reckoning
- System health monitoring
- Speed, temperature & fuel level sensors
- Night vision with pedestrian detection
CONTEXT SENSITIVITY IS THE KEY

Location, route & destination

Time constraints & events

Social ties

Favorite activities

Preferances

Needs
MAKING USE OF THE SENSOR PLATFORM – EXAMPLE

Smartphone based re-fuel recommendation

- need gas?
- what type?
- along route?

future vehicle-integrated re-fuel recommendation

need gas!  type!  route!
I'm a car in traffic! (not a pedestrian!)

I just started to rain!

I'm on a road that's not in the map!

I saw a speed limit which is not in the map!

I can see other cars around me by radar!

I have just found a fuel efficient route!

I just ran over a pothole, watch out!
ACTIVE VS. PASSIVE CROWD SOURCING

Active

- user input required
- driver distraction is an issue
- quality is an issue
- limited to data seen by the driver

Passive

- no user input required
- no driver distraction
- quality defined by sensors/algorithms
- limited to data detected by the sensors
CROWDSOURCING IN THE CLOUD

Connected vehicles share information with others

One vehicle can’t observe what the whole fleet has experienced

→ Implicit transition towards off-board, cloud-based services.

→ Hybrid operations with basic information on-board, extended information off-board.
THE BUSINESS CASE: THE VALUE OF DATA?

- Sensor/Processing Costs
- Data Costs
- Server Costs
- Third Party Partners?
- Internal Benefits to BMW
- Customer Value
- Service/Revenue?
- Building an Ecosystem
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Smart re-fueling
Social networks
Predictive energy managment
Improved map data
In-car entertainment
THANK YOU

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