Robotics in Hazardous Environments

... from Space to Underwater

Frank Kirchner
Challenge: Autonomous Mobility

- 3 times more from MER to MSL
- 10 times more from MER to SFR

We need more research

Speed
open loop driving
Average speed
Intelligent Mobility

Outdoor Mobility (Eich et.al., 2009)

Outdoor Intelligence (Schwendner et.al., 2011)
Mobile Manipulation

High Mobility, simple Manipulation
Bartsch, et.al., 2010

dGea et.al., 2011

High Mobility, redundant Manipulation
Cordes et.al, 2011
Projekt SeeGrip

- Three finger Gripper with 2 joints/finger
- Over 800 tactile Sensors on each finger → Haptic Feedback
- Sensitive Gripping → bad sight conditions
- Automatic Identification from tactile information (tactile camera)
- Deep Sea qualified: 600bar Water Pressure 6000m Depth
Transfer
Maritime Resources

Hildebrandt, et.al, 2009

Albiez, et.al, 2009

Duda, et.al, 2011

Hildebrandt, et.al, 2008
E-Mobility
Vielen Dank für Ihre Aufmerksamkeit

DFKI - Robotic Innovation Center