Team Information

Name of vehicle: **SmarTer** (***Smar****t All* ***Ter****rain*)

Name of team leader: Roland Siegwart

Team Name: **Smart-Team**

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Website: http://smart-Team.ch

Location: Lausanne, Switzerland

Institution/Company: 1) EPFL, Ecole Polytechnique Fédérale de Lausanne, Switzerland
2) ALU-FR, Albert-Ludwigs-University of Freiburg, Germany

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Team Description: The core of the SmartTeam is composed of around a dozen of researchers from EPFL's Autonomous Systems Lab (ASL) and ALU-FR's Autonomous Intelligent Systems Lab (AIS). It is structured in five main R&D areas concerned with *Systems Design*, *Computing*, *Navigation*, *3D Mapping* and *Scene Analysis*. Our team is technically and financially supported by various partner companies. The main team members are:

Team Leader:
- Roland Siegwart, ASL-EPFL (team leader, director ASL)
- Wolfram Burgard, AIS-ALU-FR (co-team leader, director AIS)

Technical Team Leader:
- Pierre Lamon, ASL-EPFL (technical project leader)

Core Team:
- Sascha Kolski, ASL-EPFL (**3D Mapping** / Navigation / Systems Design)
- Frederic Pont, ASL-EPFL (**Computing** / Systems Design / Navigation)
- Cyrill Stachniss, AIS-ALU-FR (**Scene Analysis** /3 D Mapping)
- Kristijan Macek, ASL-EPFL (**Navigation**)
- Davide Scaramuzza, ASL-EPFL (3D Mapping / Scene Analysis)
- Luciano Spinello, ASL-EPFL (3D Mapping / Scene Analysis)
- Patrick Pfaff, AIS-ALU-FR (3D Mapping)
- Rudolph Triebel, AIS-ALU-FR (3D Mapping / Scene Analysis)

Team Information

Other Key Members:

- Tarek Baaboura, ASL-EPFL (Systems Design)
- Daniel Burnier, ASL-EPFL (Systems Design)
- Marcelo Becker, ASL-EPFL (Systems Design / Navigation)
- Dave Ferguson, ASL-EPFL / RI - Carnegie Mellon University (Navigation)
- Stefan Gaechter, ASL-EPFL (Scene Analysis)
- Giorgio Grisetti, AIS-ALU-FR (Scene Analysis /3 D Mapping)
- Bjoern Jensen, Singleton Technology Sarl (3D Mapping)
- Hanspeter Kaufmann, RUAG Land Systems (Systems Design)
- Oscar Martinez Mozos, AIS-ALU-FR (Scene Analysis /3 D Mapping)
- Viet Tuan Nguyen, ASL-EPFL (Scene Analysis)
- Christian Plagemann, AIS-ALU-FR (Scene Analysis /3 D Mapping)
- Axel Rottmann, AIS-ALU-FR (Scene Analysis /3 D Mapping)
- Gernot Spiegelberg, Com In Motion (Systems Design)
- Armin Sulzmann, Com In Motion (Systems Design)
- Gregoire Terrien, ASL-EPFL (Systems Design)
- Shrihari Vasudevan, ASL-EPFL (Scene Analysis)
- Jan Weingarten, ASL-EPFL (3D Mapping)

The System:	Our vehicle called ***SmartTer*** (**Smart** all **Ter**rain Vehicle) is based on a standard Smart car that has been enhanced for fully autonomous driving in somewhat flat outdoor environments. It is equipped with two frontal SICK laser scanner sensors for obstacle avoidance and local navigation, a rotating SICK (3D) and omni-directional camera for 3D mapping, an inertial measurement system (IMU) for motion and pose estimation and a GPS system as absolute reference. The SmartTer is intended to establish a fully 3D map (using the 3D laser and omni-came images) while fully autonomously driving along the ELROB 2006 route. The basic navigation and vehicle control task will be implemented on one of the two onboard computers, whereas the other is dedicated for 3D mapping and scene analysis. The navigation tasks (local planning, obstacle avoidance, vehicle control) are expected to run in real time at update rates of around 10-30 Hz. The 3D map will be updated around once every second, enabling for global path planning and object recognition (scene analysis) at reasonably high rates. The development of the ***SmartTer*** has been started in October. The system with all sensors is expected to be ready by the end of 2005. Real world testing with all basic functionalities is planned for February 2006.
Sponsors / Supporters:	RUAG Land Systems (Vehicle Design, Testing) Singleton Technology Sarl (3D Mapping) Com In Motion (Systems Design)
Selection of scenario:	non-urban