# Intelligent driver assistance systems for autonomous vehicles and aircraft

Made in Austria: camera-based driver assistance systems for autonomous vehicles and sensor fusion in the transport and construction machinery sector

The AIT Austrian Institute of Technology has comprehensive expertise in the field of Intelligent Vision Systems with a focus on advanced camera technology and self-learning IT systems. In this context, AIT experts have developed a dedicated 3D sensor system enabling vehicles to capture their environment in 3D in real time for reliable and driver-independent navigation, thus providing a key component of vehicle assistance systems. An important goal is to improve safety by supporting the driver while also improving efficiency, especially in the area of mobile machines for industry, construction and agriculture. The technologies available also enable the realisation of fully autonomous vehicles. The spectrum ranges from rail vehicles (trains, trams), road vehicles (cars, trucks) and vehicles used in the construction and agricultural industries (excavators, tractors etc.) through to aircraft.
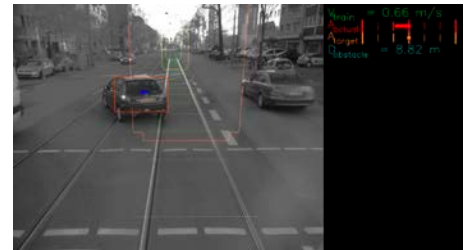
Rail, road and off-road applications

The AIT technologies are developed into commercial systems in close cooperation with industrial partners. Working together with Bombardier, AIT experts are developing an internationally unique driver assistance system for trams. The new technology enables the tram to recognise a variety of objects, such as vehicles or people, to independently assess their hazard potential and respond appropriately, thus revolutionising tram safety. In the construction sector the innovative assistance technology is used in cooperation with Liebherr to capture the vehicle environment of heavy mobile machines. This is essential as the environment of wheel loaders still presents a high accident risk for both the driver and workers. You'll find a video demonstrating this application here.

AIT technologies also enable the realisation of fully autonomous vehicles such as the modern drive-by-wire tractor recently presented at the European Land Robot Challenge (ELROB). The tractor has been developed into a completely autonomous vehicle for use in special off-road scenarios using AIT driver assistance technology. This marks an important step towards opening up new innovative applications, e.g. in agriculture (precision farming). The technology is developed in close collaboration with Austrian partners and receives funding from the Federal Ministry of Transport, Innovation and Technology (BMVIT) under the national Research Programme "IKT der Zukunft".

AIT Airborne Vision

Sensor technologies developed by AIT can also be used in the aviation industry to detect potential obstacles both in the air and on the ground (e.g. objects on the runway). They provide the basis for pilot assistance systems or autonomous unmanned aircraft. However, this will require reliable obstacle detection under different environmental conditions, the capability to perform evasive manoeuvres to avoid collisions, and reliable self-localisation without satellite navigation. The key objective is to increase safety in manned aviation by assisting the pilot and to expand the applications of unmanned systems, e.g. for generating situation maps for crisis and disaster management in the event of fire, floods, avalanches or large events, where locating endangered people or determining the spread of toxic gases are of critical importance. Important future application scenarios also include the monitoring of critical infrastructure such as power lines, dams or industrial facilities. You'll find a video demonstrating this application here.
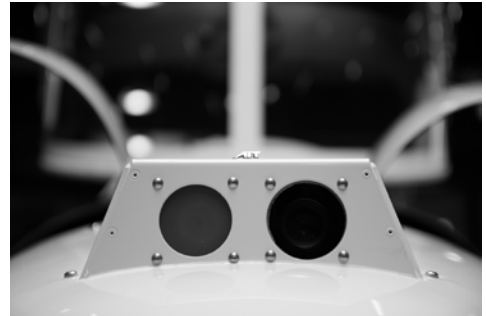
Scientific Vision Days
Technology presentations at the AIT stand

This year we again invite you to attend **presentations** on the latest innovations and technologies in the field of image processing. The presentations are given directly at **AIT stand 1D82** by AIT experts, as well as customers and partners from industry and research. Programme details are available at the trade fair and at **www.ait.ac.at/svd**.

Visit us at Vision 2016

Hall 1, L-Bank Forum
Stand: 1D82

Contact:
Mag. (FH) Michael Mürling
AIT Austrian Institute of Technology
Digital Safety & Security Department
Donau-City-Strasse 1, 1220 Vienna, Austria
eMail: michael.muerling@ait.ac.at
Mobile: +43 664 235 17 47
Web: www.ait.ac.at