



Tronis®
efficient | imaging

In a nutshell

IMPRESSIVE USER
EXPERIENCE

ACCESS TO
3D OBJECTS

GROUND TRUTH

STATE-OF-THE-ART
ENGINE

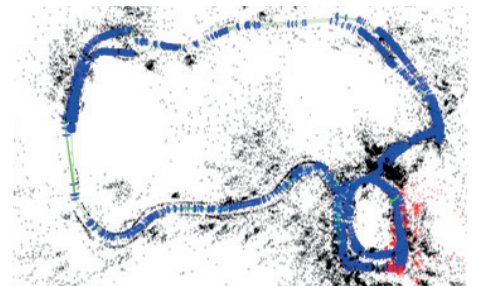
Tronis® is an environment for the **virtual prototyping and safeguarding of advanced driver assistance systems, e.g. for highly automated or autonomous driving**. Based on a modern and modular 3D gaming engine, driving situations and traffic scenarios can be efficiently imaged and tested, e.g. for camera and radar-based environmental detection. As a result, the development of corresponding systems can be **significantly accelerated** and the **need and costs for real prototypes can be reduced**.

In contrast to virtual environments of the last generation, **Tronis®** has a very high level of detail, thus allowing to explore strengths and weaknesses of image processing algorithms to be examined at an unprecedented depth. Complex effects such as shadows of wind-blown leaves, reflections of a wet road or rain are considered for the first time. When looking at a road sign, in contrast to the first-generation environments, not only textures are visible, but also the fine reflection honeycombs, which can increase the visibility of the shield depending on the light conditions. The use of large 3D worlds also allows virtual trips within mountain, forest, city and lake areas. The existing network interface allows the use of **Tronis®** with several clients in a 3D world. Besides improving assistance systems, **Tronis®** can also be used to experience your assistance system on the steering wheel of virtual vehicles with an **impressive user experience**.

With access to all 3D objects, their position and properties, an **optimal ground-truth for tracking and mapping procedures** is available. By accessing various buffers, e.g. depth or rough objects, the creative development of new algorithms in the field of computer vision is stimulated. The high level of detail of the 3D worlds is also excellent for training and validating object recognition algorithms, e.g. based on neural networks.



Route from aerial view



Route with mapping and localization

FEATURE LIST

Modern 3D Engine Simple Interface

- OpenCV access to image buffer
- TCP / UDP image transport

Realistic representation

- Foliage (trees) in the wind with shadow
- Reflections of a wet road, rain
- Great landscapes, mountains, forests, lakes, cities
- Consideration of material properties

Realistic physics, engine and environment

- Animated persons
- Vehicles
- Navigation system for AI (persons, vehicles)
- Traffic light systems, barriers

Ground Truth

- Access to all 3D objects
- Object class Search
- Object planes: e.g. houses, signs, trees
- Material planes: e.g. metallic, rough, transparent, specular

Development of algorithms

- Linking Matlab / Simulink or comparable simulation models
- RMOD-K

APPLICATION AREAS

- Driver assistance systems
- Localization and mapping
- Training of neural networks for e.g. object recognition
- demonstrators

More

- Radarsimulation, sensors
- Automatic creation of 3D maps

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