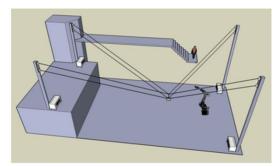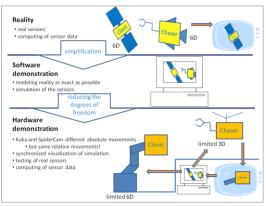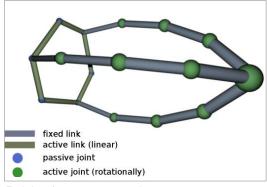# INVERITAS

Rendez-Vous and Capture in Space

Schematic representation of the long-distance movement simulation system

Hardware-/software-demonstration, conversion from 12D to 9D

Legend:
- fixed link
- active link (linear)
- passive joint
- active joint (rotationally)

Evolution of new capture-strategies

Innovative Technologies for Relative Navigation (Movement) and Capture of Mobile Autonomous Systems

INVERITAS is a joint project including the partners EADS-ASTRIUM, Jena-Optronik, and the Robotics Innovation Center of the German Research Center for Artificial Intelligence (RIC DFKI Bremen).

The main goal of INVERITAS is the prototypic realization of a broad-spectrum rendezvous-and-capture (RvC) system and the development of the necessary core technologies with respect to the improvement of the technology readiness level (TRL) up to TRL4 (demonstration on the surface). All fundamental technologies necessary to engineer a capture-satellite will be developed. This satellite has to be able to capture other, possibly uncooperative (due to prior damage or failure) satellites in orbit around a planetary mass, and to conduct maintenance or refueling tasks.

Primary tasks of the DFKI RIC during the INVERITAS project will be the development of a long-distance movement simulation system (LBSS) in hard- and software, and the development of alternative grasping strategies.

The LBSS will be coupled with a novel modular software simulator and a 3D-visualization.

The physical technology demonstrators for the capture-satellite and the client will be realized by a six-axis industrial robot and a cable-guided 3D-movement system which combined form the LBSS. When transmitting simulation results to the LBSS, the total of 12 degrees of freedom of the real capture-satellite and the client will be converted to the all in all nine degrees of freedom of the robot and the cable-guided 3D-movement system.

The simulation system will be used to evaluate alternative grasping strategies. Genetic algorithms will automatically evolve new kinematic systems and strategies which will improve the flexibility of such capture systems.

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Project partner:

EADS astrium

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