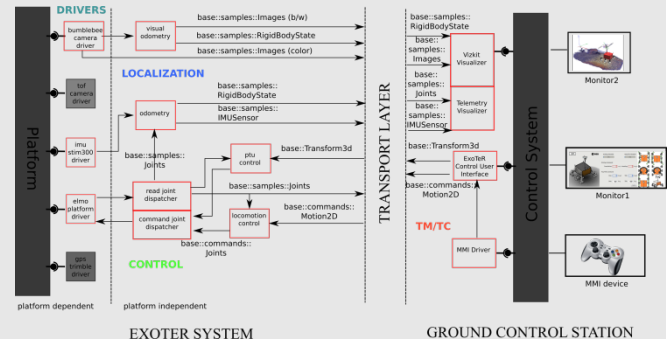German Research Center for Artificial Intelligence

# SARGON

## Space Automation & Robotics General Controller



*The ExoMars Testing Rover (ExoTeR) is ESA's half-scale reproduction of the ExoMars rover. ExoTeR is the testing platform for the SARGON activity. (Photo: Martin Azkarate, ESA, HESpace)*



*ExoTeR component diagram with the most relevant tasks to perform semi-autonomous navigation (Source: Javier Hidalgo Carrió, DFKI GmbH)*

The SARGON activity is devoted to the design of a Robot Control Operating Software (RCOS) based on existing open-source software as Rock and on the TASTE toolset, with special care on its RAMS characteristics. Similarly to Rock, the TASTE framework provides a model-driven approach more in the direction for the development of on-board software. This activity focuses on the analysis of requirements for an RCOS and what is needed to complement the current TASTE implementation for covering all needed RCOS functionalities. A TASTE RCOS application will be implemented first on a laboratory-level and then on a space-quality level prototype over ESA's ExoTeR rover. The aim of this TASTE RCOS is to be the base of future European space robotics applications, and in this context this activity is a first step in that direction.

The main focus of this project is the aspect of operating software controller for space robotics. The goal of SARGON is the design and implementation of a framework and tools for the programming of robots with emphasis in on-board space hardware. The first part of the project is to collect a set of user and system requirement from the robotics open source community and the space industry in order to shape the first prototype of a SARGON TASTE architecture. In such architecture, the consortium takes particular care of RAMS (Reliability, Availability, Maintainability and Safety) with the support of the BIP framework. The second phase of the project will be devoted to the implementation of an application software, first at laboratory level and then at space-quality level, that will serve as a kind of validation test bench for the TASTE

SARGON implementation. ExoTeR will be used as testing platform from ESA during the activity, together with using space-quality processor such as LEON processor for space applications.

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