# ASSET: Virtual Environments in Teleoperation Systems

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**Abstract**

A teleoperation system allows an operator to execute a remote task. Teleoperation eliminates the risks associated with dangerous works. It implies that to allow the operator to work efficiently, it is indispensable to present him all the information necessary to carry out his task. Furthermore, this information must be easy to interpret and delivered through a system of fluid communication. For these different reasons, there is a great interest for the application of virtual environments in teleoperation. We develop a system, based on virtual environments, portable and extensible, intended to facilitate the construction of new systems of teleoperation. ASSET system (System Architecture for Simulation and Training in Teleoperation) is a tool specialized in the development of new teleoperation systems, the fast construction of prototypes, programs of tests for new devices or simulation models, and mission management (control, simulation, planning). This system is a set of Java classes which can be adapted easily to the particular conditions of an application of teleoperation. Now, ASSET system offers the services of 3D visualization, collision detection, devices management, communications, definition of behavior for each simulation object and reading of Java3D and VRML2.0 models. Among envisaged perspectives, our system will allow the realization of a mission by the collaboration of several users and the use of cooperative autonomous robots.

**Keywords:** teleoperation, virtual environments, development platform, simulation, human-computer interfaces.