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# emss Framework

## Environment Mapping Self-Sustainable Robot

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Subject Area	Software



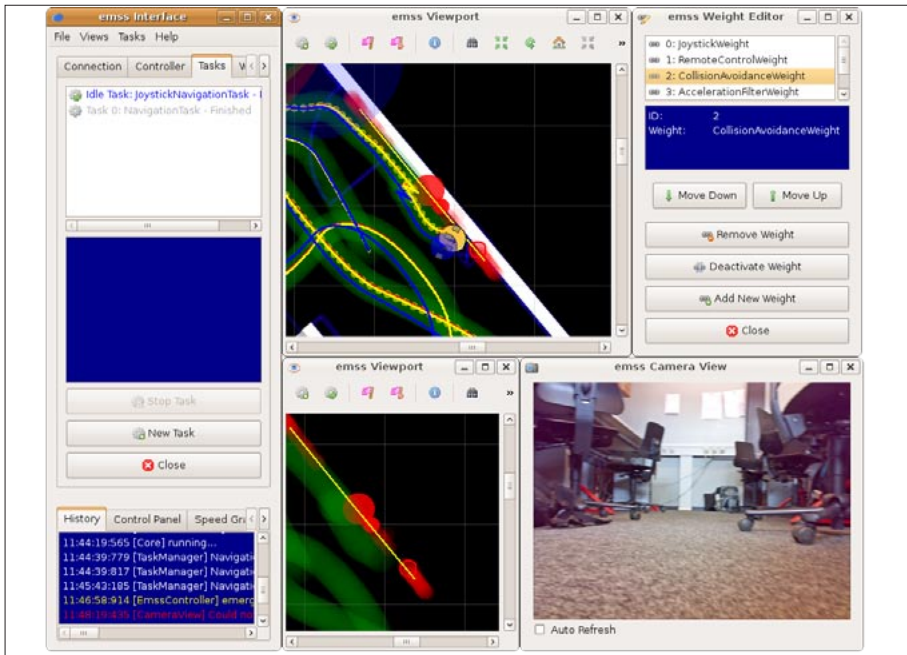
Robot with Docking Station

**Topic:** The aim of the emss project is to tackle the problems of a self-sustainable, environment-mapping robot in a bottom up approach. The major challenges imposed by such a mobile robot include the assembly of hardware, and more importantly the necessary software algorithms for localization, navigation, and discovery. Using ready-made hardware, many of the time-consuming electrical engineering problems have been avoided, allowing a strong focus on software.

**Scope:** Building upon previous work achieved in our Semester Project, the goal of this Bachelor

Thesis is to create a basic environment map of obstacles and floor plan to the most accurate degree possible with the given hardware and data sources while safely navigating and exploring the area. In addition, third-party applications must be able to connect to the emss framework and make use of the positioning data for their own purposes.

**Results:** The emss framework, consisting of a set of »hot-swappable“ software modules, provides an extensible design, which allows a wide array of functionality and supports different strategies



Framework controlling the Robot

for the same problem. Safe navigation has been achieved by intelligently avoiding drops, obstacles, and walls. Furthermore, small areas can be autonomously navigated and mapped using different algorithms. Collaboration with third-party software has been realized with a Wireless Positioning System where necessary signal reference points are automatically collected. Other routine tasks, such as docking the robot on its charging station, have been implemented.

More information, source code, downloads, and videos can be found at: <http://emssframework.sourceforge.net>