

The need

In recent years, **the application of robotics to automation of large-scale post-production (i.e. aircrafts, ships, construction) is having difficulties to carry out efficiently all life-cycle stages (i.e. repair, maintenance, replacement and handling)** because the robotic systems designed for the majority of large-scale products do not allow to design flexible automation solutions suitable for wide ranges of industrial processes.

Furthermore, robotic or automated systems must compete with existing highly flexible manual labour-based solutions but with their corresponding low productivity, which contrast to the widespread use of robotics in the small-scale industries. Others limitations for robotics to be commonplace in large-scale post-production sites are the economic cost of investment and larger power needs than current solutions require.

Project partners



Contact

Project coordinator

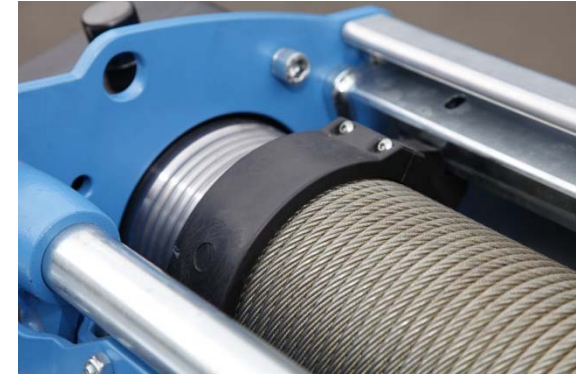
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Parallel Cable Robotics for Improving Maintenance and Logistics of Large-Scale Products

NMP2-SL-2011-285404



The objective

Funded under FP7-FoF-NMP-ICT, the main objective of the CableBOT project is the **development of a new generation of modular and reconfigurable robotic devices that are capable to perform many different steps in the life-cycle stages of large-scale structures.**

The CableBOT project deals with a novel methodology for **designing, developing and evaluating cable robots customised for the automation in large-scale auxiliary processes.** Parallel cable robots extend the payloads and workspace of conventional industrial robots by more than two orders of magnitude.

The technology

Three key technologies will be developed to enable the objectives:

- **Design of Cable Robot:** Software tools to design the layout and geometry of cable robots. The ad-hoc connection of groups of winches to different end-effectors creates different setups for cable robots in order to achieve flexibility and reconfigurability.
- **Industrial Process Planning:** Simulation of cable robots to verify the operation of cable robots in environments with large-scale structures
- **Control Algorithms and Systems:** Distributed control and kinematic transformation to operate modular cable robots such as grids of cable robots under industrial requirements.

The industrial applications

The combination of these technologies in an integrated robotic system results in a versatile system. CableBOT will demonstrate the potential of such automated systems for life-cycle **maintenance and repairing of aircrafts** and to introduce automation in life-cycle applications in the **construction industry** such as **handling of beams.**

Both applications are characterized by the fact that the state-of-the-art automation can hardly be used due to manoeuvrability of heavy and large structures and risks associated. **The results are feasible for many other fields including large-workspace movements of products, with impact in logistics, transport, and warehousing.**

