

Power- Energy sources and their management in **Complex Attended Robots** for transport applications

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Abstract: One of the main limiting factor in robotics is power supply. All related technologies have currently reached a know-how threshold difficult to overtake. At this time, the energy problem is threefold:

- Temporal: too short life of the power source, too short use duration, too long charge duration
- Dimensional: voluminous and heavy power source necessary for the requirements
- Energetic: increasing power consumption of devices and micro-devices

The miniaturisation of robots adds specific problems due to the scaling down of the power sources. In this first part of the presentation we will cover the stages of the power-energy generation and its management. Starting from the basic characteristics of the available state of the art batteries we will move to the current research on: harvesting methods, conventional microfuel cell, bio-fuel cell and novel microcombustion systems.

We will compare most of the known power-energy sources in terms of relative specific power and specific energy by the so called Ragone plots and will show how an hybrid selection of technologies using existing commercially available components is most time the best possible choice.

The first part will be concluded provoking the attendees with specific examples and demonstrations that could be taken as a reference for future projects in robotics and other commercial products.

The second part of the presentation is aimed at comparing **Complex Architectures for Automomous Cars** and General Robotics or advanced ones oriented at implementing human and super human performance. This block will be ended-up by presenting the vehicles developed at CRF implementing various degrees of autonomy. .

