

SOMIRO

SOFT MILLIROBOT



www.somiro.eu



THE PROJECT

SOMIRO is a Horizon 2020 funded project that will develop and demonstrate the world's first energy-autonomous swimming milli-robot with the aim of reducing the environmental impact of farming in terms of carbon footprint, eutrophication and excessive use of pesticides and feed.

These swimming milli-robots would cover a much larger area than stationary systems and they could be rapidly deployed and self-redistribute where most needed. They may serve as a stand-alone monitoring solution for indoor farming or complement drone-based remote sensing outdoors.

Until today, no other energy autonomous milli-robot has been demonstrated capable to withstand hours of continuous operation.

The major reason is power limitation: locomotion requires much power and small robots have very limited energy storage and energy uptake.

Our goal is that the SOMIRO millirobots should reach sizes down to 10 mm long and look like the flatworms in the ocean. They will show that soft and stretchable systems require much less energy for movement than other robots of comparable size. To power, they will not rely on any dedicated energy infrastructure but only on natural sunlight.

SOMIRO soft milli-robots will initially be tested in two different types of water environment, an aquaponic system and a paddy field, both located in Italy, but in the long-term, SOMIRO will be able to provide new tools for different areas of precision agriculture.

TESTING



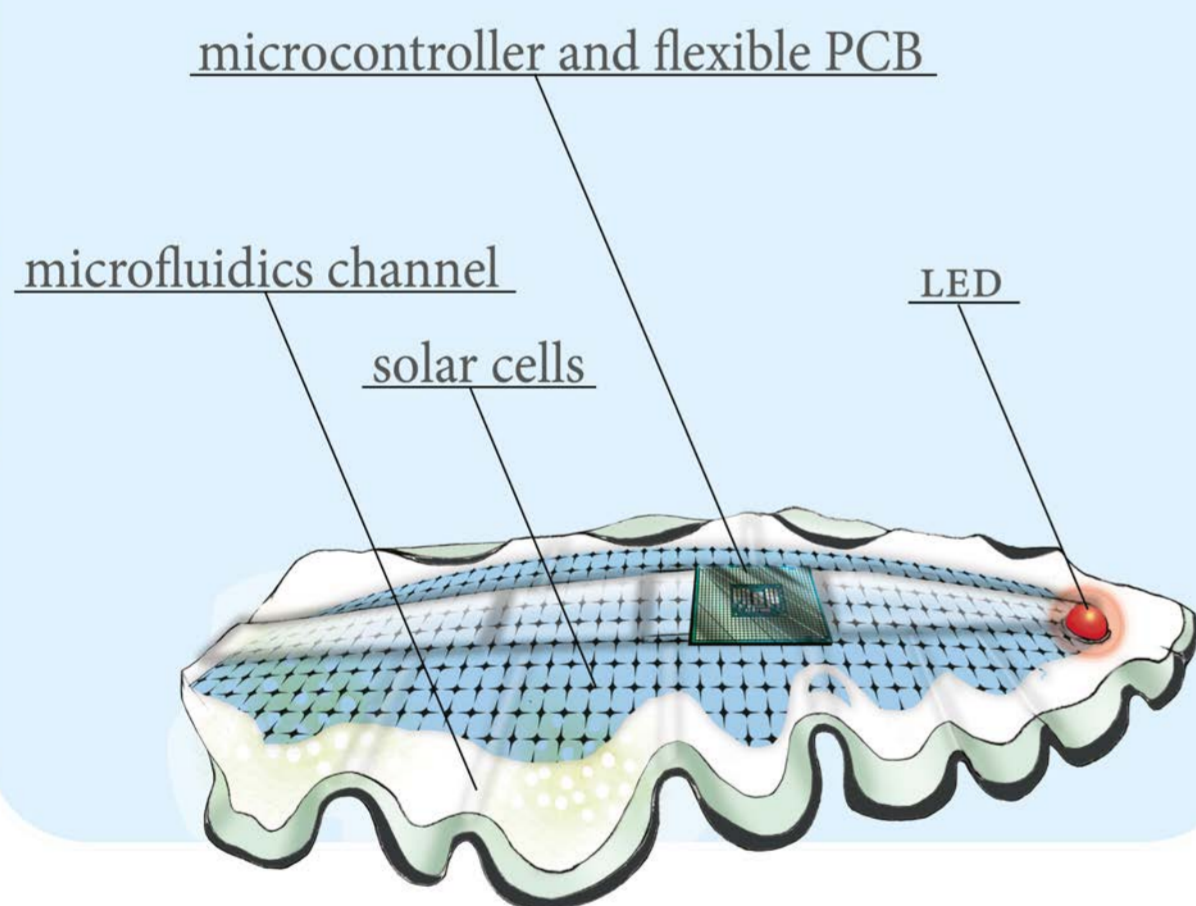
Riso Preciso Paddy Field Novara, Italy



The Circle Aquaponics System Roma, Italy

THE MILLI-ROBOT

SOMIRO MILLI-ROBOT INITIAL CONCEPT



PROPULSION

Motion will be undulating soft fins on both sides of milli-robot body, allowing forward and backward motion, as well as steering.

AUTONOMY IN ENERGY, CONTROL AND MOTION

SOMIRO will harvest energy only from the normal ambient, it will decide on its own where to go, in which direction and when to perform given tasks.

SENSING AND COMMUNICATION

It will measure presence and concentration of chemical compounds relevant for precision agriculture and use wireless optical communication.

EXPECTED IMPACTS

STRENGTHENING EUROPEAN EXCELLENCE IN ROBOTICS SCIENCE & TECHNOLOGY

Energy autonomy by soft and ultra flexible technology for solar cells and locomotion.

OPENING UP NEW MARKETS FOR ROBOTICS

Precision agriculture and aquaponic green houses. Monitoring of outdoor water environments.

LOWERING BARRIERS FOR ROBOTIC SOLUTIONS

Autonomous microrobots will remove a main barrier for outdoor solutions.

BOOSTING THE USE OF ROBOTICS IN PROMISING APPLICATION AREAS

Novel miniaturized technology will boost the use of robotics:

- high-voltage up-converters
- power-efficient sensors and actuators
- high-resolution digital soft PCB technology

PARTNERS



PROJECT DETAILS:

PROJECT TITLE: Soft Milli-robot
START/END: Jan 2021 - Dec 2023
EU CONTRIBUTION: EUR 2,992,200
TOPIC: ICT-47-2020 | Research and Innovation boosting promising robotics applications

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