ROBOTS IN DISTRESS, BOREDOMRESEARCH (VICKY ISLEY & PAUL SMITH)

1/ SUBCULTRON, A ROBOTICS FET OPEN PROJECT

2/ RESEARCH GOAL

1/ SUBCULTRON, A ROBOTICS FET OPEN PROJECT : SUBMARINE CULTURES PERFORM LONG-TERM ROBOTIC EXPLORATION OF UNCONVENTIONAL ENVIRONMENTAL NICHES

Robots in Distress is an artwork that has been created as part of the artists residency in the subCULTron consortium, one of the European Union Horizon 2020 FET/Open Future and Emerging Technologies projects.
FET Open supports the early-stages of the science and technology research and innovation around new ideas towards radically new future technologies.

subCULTron is combining biology and engineering to create a swarm of autonomous self-learning robots in a bio-inspired approach in order to monitor and perform in harsh environments such as the heavily human polluted Venice Lagoon.

(from the subCULTron documents)
This project is aiming at creating **the world's largest intelligent underwater monitoring system that coordinates, communicates and collects data autonomously**. It will do this via a society of self-organising underwater robots.

subCULTron aims to develop an autonomous underwater robotic society comprising of three swarms of bio-inspired robots that monitor the environment in a marine habitat.
The focus of the subCULTron project is on utilization of bio-inspired behaviours, cultural learning, swarm behaviours for increased stability and adaptability in harsh environments. Apart from contributing to the scientific community by developing novel bioinspired behaviours and implementing a real world application of a robotic swarm, the subCULTron system will also gather enormous amounts of environmental data which can be used to fine tune nature preservation policies, industrial techniques, etc.

Our heterogeneous system consists of 3 different agent types:
On the sea-ground, *artificial mussels* are the collective long-term memory of the system,

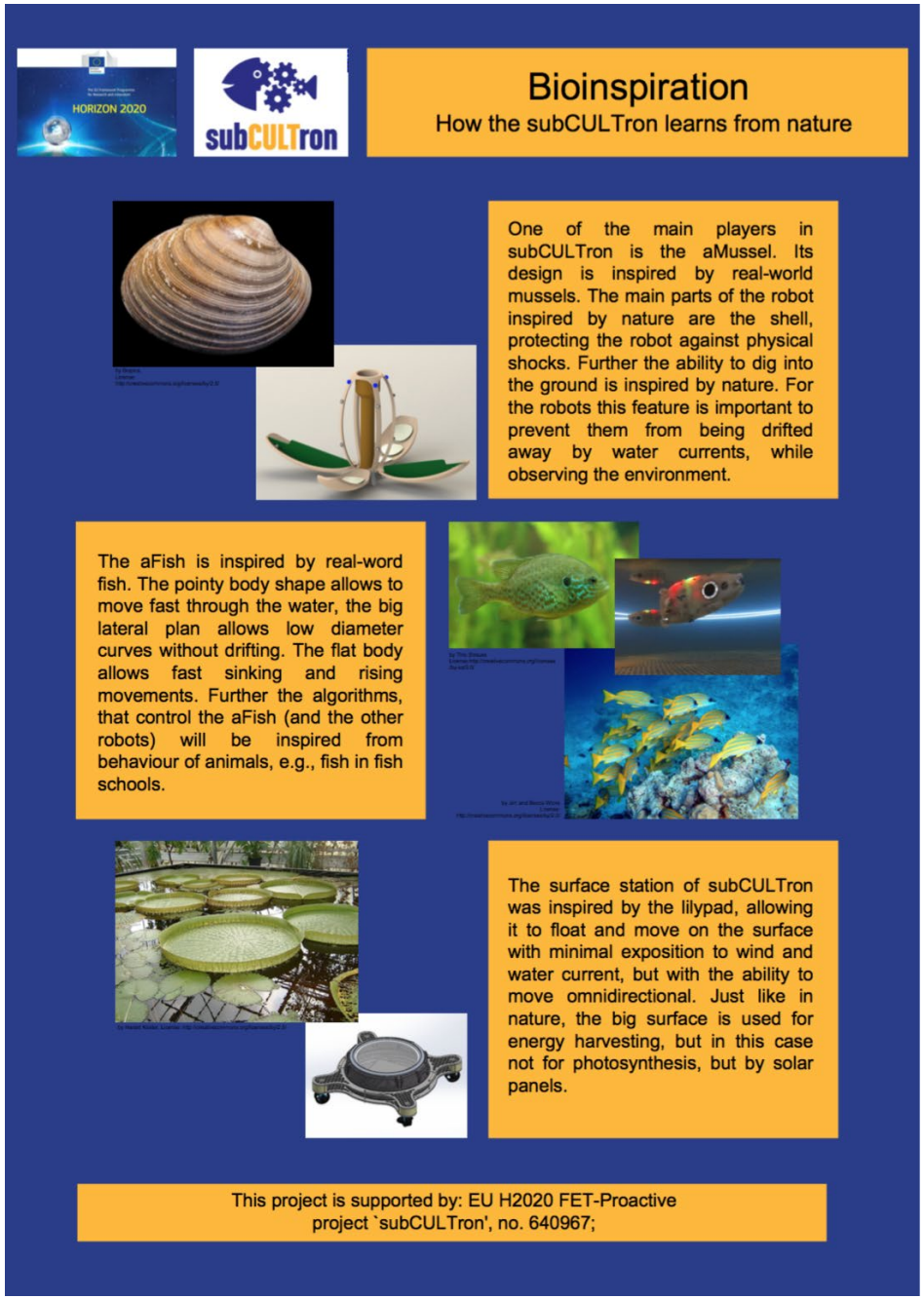
subCULTron

allowing information to stay beyond the runtime of other agents, thus allowing to continue learning from previously learned states. These mussels monitor the natural habitat, including biological agents like algae, bacterial incrustation and fish.

On the water surface, *artificial lily pads* interface with the human society, delivering energy and information influx from ship traffic or satellite data.

Between those two layers, *artificial fish* move/monitor/explore the environment and exchange info with the mussels and lily pads. Artificial mussels are novel class of underwater agents.

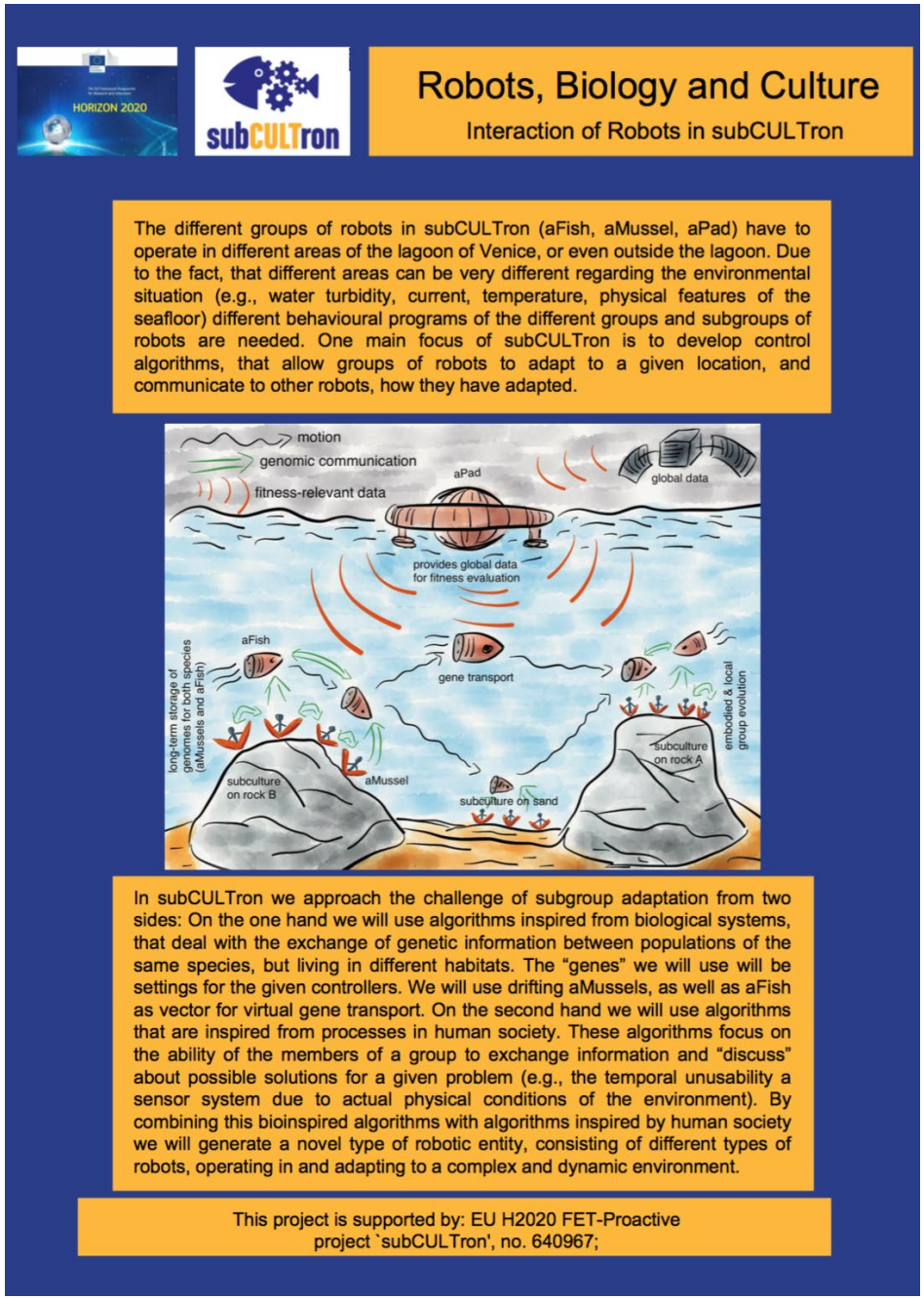
We aim to push forward the edge of knowledge with novel sensors (electric sense/electro-communication), novel bio-inspired algorithms (underwater hives) and novel energy harvesting in underwater scenarios.



"In a few words, what we are trying to do is to go beyond the logic of individual complex machines, like many underwater robots are today, to deploy a collective cognitive system with high potential for learning and self-adaptation. This might actually prove an effective approach to work in marine environments which are very dynamic and require adaptive capacities to be explored in their complexity" summarizes scientist Thomas Schmickl.

The subCULTron project is conducted in consortium with eight partners spread across five countries in the European Union. The project is being coordinated by the Artificial Life Lab at the Institute of Zoology, Karl Frazens Universität, Graz, Austria. The Artificial Life Lab, under the leadership of Prof. Dr. Thomas Schmickl, specialises in research on swarm intelligence.

http://www.subcultron.eu/



2/ RESEARCH GOAL

The goal of the research of subCULTron explained by the scientist Roland Thenius from the University of Graz

https://www.youtube.com/watch?v=COddmcGgBc8

CREDITS

«Robots in Distress» has been created by boredomresearch
in collaboration with subCULTron (www.subcultron.eu),
Artificial Life Lab, Karl Franzens University Graz (http://zool33.uni-graz.at/artlife/)

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