subCULTron aims for achieving long-term autonomy in a learning, self-regulating, self-sustaining underwater society/culture of robots in a high-impact application area: Venice, Italy. Our heterogeneous system consists of 3 different agent types: On the sea-ground, artificial mussels are the collective long-term memory of the system, 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 lilypads 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 lilypads. Artificial mussels are a 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. We will improve the world's record for swarm-size in autonomous collective underwater robotics by almost one order of magnitude. Our application field is a human- and animal-co-inhabited real-world environment of high impact: Venice canals & lagoon. These habitats are highly dynamic and structured, expected to be reflected by a spatial self-structuring of our mussel population. These sub-populations locally perform memetic/cultural learning algorithms on their specific local data. Thus our cultural evolution algorithms will promote sub-culture
development, similar to the human society that does the same above the water level in parallel. Overall, we aim for an artificial society underneath the water-surface to the service of a human society above the water.

Field of Science

- phycology
- learning
- robotics

Programme(s)

- H2020-EU.1.2.2. - FET Proactive

Topic(s)

- FETPROACT-2-2014 - Knowing, doing, being: cognition beyond problem solving

Call for proposal

- H2020-FETPROACT-2014

See other projects for this call

Funding Scheme

- RIA - Research and Innovation action

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<td>€ 393 935</td>
<td>France</td>
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<tr>
<td>Boulevard Saint Michel 60 75272 Paris</td>
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| CORILA - CONSORZIO PER IL COORDINAMENTO DELLE RICERCHE INERENTI AL SISTEMA LAGUNARE DI VENEZIA | € 293 694 | Italy |
| Address | Activity type |
| San Marco 2847 30124 Venezia | Research Organisations |

| CYBERTRONICA UG (HAFTUNGSBESCHRANKT) GMBH | € 626 748 | Germany |
| Address | Activity type |
| Melunerstrasse 40 70569 Stuttgart | Private for-profit entities (excluding Higher or Secondary Education Establishments) |

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