

AEROSTABLES - A new approach to HRI researches

[Extended Abstract]

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ABSTRACT

Initiated as a research-creation project by professor and artist Nicolas Reeves, the Aerostabile project quickly expanded to include researchers and artists from a wide range of disciplines. Its current phase brings together four robotic and research-creation labs with various expertises in unstable and dynamic environments. The first group, under the direction of professor Inna Sharf, is based at the department of mechanical engineering at University McGill. It works on control and modeling of blimps for satellite emulation. The second group is headed by professor Philippe Giguère from University Laval. It focuses on localization systems for robots operating in unknown outdoor environments. The third group is also from McGill, but this time from the computer science department. Headed by professor Gregory Dudek, it investigates the challenges presented by autonomous underwater robots, and by their interactions with human divers. The last team is based at the UQAM school of design. It is headed by professor Nicolas Reeves and engineer David St-Onge. It works on installations and performances in digital and algorithmic arts, and on the impact of new medias and technologies on the fields of art, architecture and design.

The Aerostabile project pushes the boundaries of engineering and art by proposing a close hybridization of the two disciplines. It redefines the human-robot interaction paradigm, working specifically on the new interfaces required by the specific nature and context of emerging robotic systems. Multidisciplinary approaches are required to seamlessly integrate aesthetics, grace and precision. Amongst the tools and strategies developed by the research team, one of the most important is the organization of regular meetings similar to art residencies, which are structured around the framework of engineering software and hardware integration workshops. During such meetings, which occur twice a year, the four groups work together with engineers and artists from different disciplines. These intense collaborative events happen in spaces large enough to fit at least two 225-cm floating robotic cubes called "Tryphons", the latest models of a series of flying automata developed by Reeves and St-Onge.

Fruitful questions and discussions emerge from these residencies, leading to new questions and development axis both in art and engineering. Whenever possible, they happen in public spaces, allowing direct contact with all kinds of audiences and with inspiring media artists and creators-researchers. The specific constraints of out-of-the-lab environments raise new problematics for all engineers, while the encounter between different academic cultures influence the development priorities. At the end of our journey, on top of the engineering papers that will be published, we aim to produce the first hybrid performance involving four performers interacting with four fully autonomous aerobots.