Title – Harmony in Dynamics: Exploring Emergent Cooperation through Participatory Art and Neuroscience

Scientific coordinator – Luciano Perondi

CUP (National Project ID) – F73C25000840007

Department – Department of Architecture and Arts

Iuav role – Project Partner

Lead Partner – University of Haifa (Israel)

Other partners – Drexel University, Philadelphia (USA)

Duration – 36 months

Start date – 01/09/2025

End date – 31/08/2028

Project budget – USD 1.200.000,00

Iuav budget – USD 133.333,33 (EUR 114.420,32)

Funding to Iuav – USD 133.333,33 (EUR 114.420,32)

Source of funding – International Human Frontier Science Program (HFSP) - HFSP Research Grants 2025

Description – Humans move fluidly between types of coordinated action, becoming part of a group that is more than the sum of its parts. Such fluid motion is not the result of some top-down control but rather arises from individual goals / rules of action paired with a common pattern of reactivities and a shared environment.

The project proposes to use the evolving participatory art piece “Ta” with the co-operation of its creator Goni Shifron, as a model, to study how emergent patterns of cooperation and synchronization arise from individual behaviors with common rules and feedback without overt communication or top-down control. Ta, a participatory art piece, is an ideal experimental setting, as we can eliminate communication and control found in regular human interactions and know that we are giving all the participants a common experience and environment in which to interact. At the same time, Ta is not random and as an art piece has purposefulness that emulates natural interactions.

The unique feature of the study is that it combines a study of the dynamics of participants and their brain patterns to find the underlying interaction of rules and feedback. In this way the project will define clearly, in a way hitherto impossible, when action, intent and brain patterns synchronize such that the individual participants become a coherent whole as parts of Ta. By doing so we will learn what kinds of interactions allow for the emergence of a group in action and when such emergence is hampered.

Objectives – The project proposal aims to explore the emergence of stable group dynamics in biological and social systems using the participatory art piece Ta as a model system. In Ta, 9-12 participants sit at a table with groups of pebbles of varying sizes and follow simple rules to move these pebbles between groups while maintaining an overall relationship among them. Without explicit communication, participants create a group performance with a predictable pattern of pebble motion. We believe that these emergent patterns of shared motion can serve as a model for understanding the multiscale relationships by which groups form and adapt, both in human societies and biological systems.

Website – www.hfsp.org/node/75847

Instagram - @harmony_in_dynamics