



IEEE IROS 2020 Workshop on *Animal-Robot Interaction*

Title

Computational and robotic modelling reveal parsimonious combinations of interactions between individuals in schooling fish

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Abstract

How do fish integrate and combine information from multiple neighbors when swimming in a school? What is the minimum amount of information about their environment needed to coordinate their motion? To answer these questions, we combine experiments with computational and robotic modeling to test several hypotheses about how individual fish could integrate and combine the information on the behavior of their neighbors when swimming in groups. Our research shows that, for robots simulation, using the information of two neighbors is sufficient to qualitatively reproduce the collective motion patterns observed in groups of fish. Remarkably, our results also show that it is possible to obtain group cohesion and coherent collective motion over long periods of time even when individuals only interact with their most influential neighbor, that is, the one that exerts the most important effect on their heading variation.