



Minimal Agency Detection in Evolutionary Robotics Model and Experiments

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Agency detection is studied in a simple simulated model and empirical experiments. In order to keep the consistency between the model and experiments, minimal action and sensation are set up in a same way as Lenay's experiment where two blindfolded subjects are interacting while moving left or right in 1D virtual space and sensing tactile stimulations. This study explores the ongoing dynamical aspects of minimal agency detection in terms of the mutuality in social interaction. In the model and experiments, agency detection is defined as the ability to Distinguish a partner's moving avatar with a dummy object that just replays the motions that are recorded when real two are interacting. It means that the motions of a dummy object and the avatar are identical in the passive observations. Only active mutual coupling enables the agency detection. In the model, an agent with an artificial neural network is modeled as a subject and the parameters of the network are trained by a genetic algorithm. The dynamics of sensation-action loop and mutuality is analyzed in both simulation and experiments, and the gap between simulation and experiments is discussed.

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