Stefano Nolfi

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Consiglio Nazionale delle Ricerche, Roma

Born in 1963 in Rome

Studied Cognitive Science at the University of Rome

FOCUS

PROJECT

The Study of the Interaction Between Evolution, Learning, and Development Through Artificial Life Models

My research interest is in the study of artificial systems (simulated agents or physical robots) that, just like natural organisms, (1) have a body and are situated in a physical environment and (2) autonomously develop their own skills in close interaction with the environment. Systems of this sort are difficult to design and can be obtained either by carefully mimicking natural organisms or by resorting to an automatic process such as artificial evolution that allows them to self-organize autonomously.

The contribution of this body of research to the understanding of natural systems is twofold. On the one hand, experiments conducted by evolving artificial organisms in specific environmental conditions can help us to understand how natural organisms solve similar problems in similar environmental conditions. On the other hand, these experiments may allow us to understand general principles that regulate natural systems.

Remarks for Other Fellows

During my stay at the Wissenschaftskolleg zu Berlin I would like to discuss with the other Fellows the following topics in particular:

Which are the key factors (neural mechanisms, on-line adaptation abilities, language) that were crucial in the emergence of higher cognitive abilities?

Sensorimotor coordination. Can we identify qualitatively different ways to exploit the interaction between an organism and the external environment? What is the relation between simple reactive behaviors and more complex strategies that also involve an ability to integrate sensorimotor information over time?

Recommended Reading

Nolfi, S. and D. Floreano. Evolutionary robotics: the biology, intelligence, and technology of self-organizing machines. Cambridge, Mass.: MIT Press/Bradford Books, 2000, 2001.

Nolfi, S. and D. Floreano. "Synthesis of autonomous robots through evolution." Trends in Cognitive Science 6, no. 1 (2002): 31-37.

Nolfi, S. and D. Marocco. "Evolving robots able to integrate sensory-motor information over time." Theory in Biosciences 120 (2001): 287-310.

EVENINGCOLLOQUIUM

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Evolutionary Robotics

PUBLICATIONS FROM THE FELLOW LIBRARY

Nolfi, Stefano (Cambridge, Mass. [u.a.],2000)

Evolutionary robotics : the biology, intelligence, and technology of self-organizing machines

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Intelligent robots and autonomous agents

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