

Introduction

by [Bill Stevenson](#)

In his landmark treatise on Artificial Life, Christopher Langton, often considered the "father of artificial life," describes the concept as *"the study of man-made systems that exhibit behaviors characteristic of natural living systems [1]."* More specifically, he says that *"artificial life is a field of study devoted to understanding life by attempting to abstract the fundamental dynamical principles underlying biological phenomena, and recreating these dynamics in other physical media - such as computers - making them accessible to new kinds of experimental manipulation and testing [2]."*

In this issue of Crossroads, we delve into this fascinating, albeit nascent field. Our investigation begins with Cory Quammen's research on evolutionary learning in mobile robot navigation. By considering the sophistication which human beings have in their sensory and motility systems, Quammen elucidates the challenges facing robotics researchers and some of the techniques used to overcome those challenges, particularly the use of evolutionary algorithms. Tony Belpaeme and Andreas Birk follow by describing the state of the art in animat research, in which robots are given some of the simpler sensory-motor properties of animals with the goal that they be autonomous and integrated with their environment. To conclude this issue, we chose Marco Grubert's captivating interdisciplinary investigation of simulated plant growth. By describing the implementation of a Lindenmayer-System with a LOGO metaphor for visualization, Grubert makes the complex topic of Artificial Life approachable and elegant.

We greatly enjoyed preparing this issue of Crossroads, and we hope that you appreciate and learn as much from these articles as we did. We look forward to entering your mailbox again this spring with our next issue, on Parallel Computing.

References

1

Langton, C. G., Artificial Life. In *Artificial Life*, Volume VI of SFI Studies in the Sciences of Complexity, edited by Langton, C. G. Redwood City: Addison-Wesley, 1989.

2

Langton, C. G., Preface. In *Artificial Life II*, Volume X of SFI Studies in the Sciences of Complexity, edited by Langton, C. G., Taylor, C., Farmer, J. D., and Rasmussen, S. Redwood City: Addison-Wesley, 1992.