

Tinkering with Turtles

An Overview of NetLogo's Extensions API

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Preferred presentation: Oral

Abstract

NetLogo [4] is a multi-agent modeling language and environment that continually strives toward a central design goal (shared with the original Logo programming language) to be both “low threshold” (easy for beginners to learn) and “no ceiling” (such that experts do not feel limited) [3]. A key aspect of the “no ceiling” goal is the extensibility of the language.

The NetLogo Extensions API provides facilities for programmers to extend the NetLogo language by creating user-defined language primitives. NetLogo extensions may be written in Java (or any other language compatible with the JVM). While the NetLogo Extensions API has quietly existed for several years, recent changes have increased its functionality. Additionally, several new example extensions have been created, or are under current development, which showcase some of the possibilities.

In this presentation, we demonstrate how to create an extension and offer a brief overview of the mechanics of the Extensions API. Additionally, we survey various extensions that have been or are currently being built, either by our research group or members of the NetLogo user community. This overview provides multiple use cases for the Extensions API. The extensions discussed address:

- new data types to NetLogo (arrays, hash tables)
- improved tools for NetLogo model development (profiler)
- communication with other software (GIS, VRML / X3D, JUNG)
- communication with hardware (robotics, webcams, joysticks/controllers)
- project-specific needs (urban modeling [1], evolution of CA rules [2])
- multimedia (sound, color palettes, images)

Finally, we offer perspectives on the current limitations of NetLogo’s extensions facilities, directions for future work, and how the Extensions API could lead to an increasingly modular architecture for NetLogo.

References

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