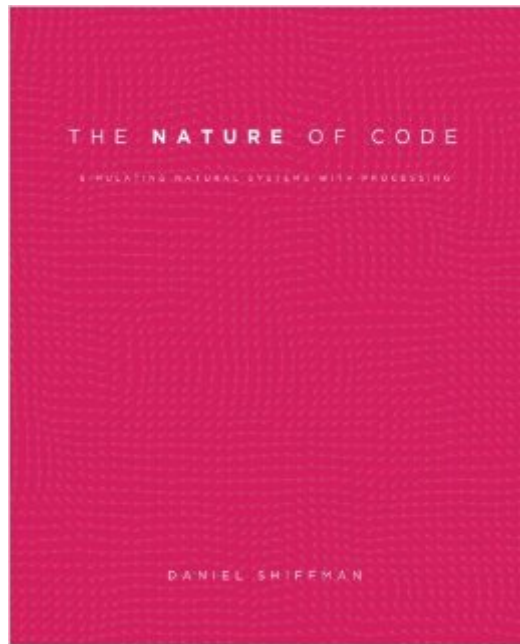


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# The Nature Of Code: Simulating Natural Systems With Processing



## Synopsis

How can we capture the unpredictable evolutionary and emergent properties of nature in software? How can understanding the mathematical principles behind our physical world help us to create digital worlds? This book focuses on a range of programming strategies and techniques behind computer simulations of natural systems, from elementary concepts in mathematics and physics to more advanced algorithms that enable sophisticated visual results. Readers will progress from building a basic physics engine to creating intelligent moving objects and complex systems, setting the foundation for further experiments in generative design. Subjects covered include forces, trigonometry, fractals, cellular automata, self-organization, and genetic algorithms. The book's examples are written in Processing, an open-source language and development environment built on top of the Java programming language. On the book's website (<http://www.natureofcode.com>), the examples run in the browser via Processing's JavaScript mode.

## Book Information

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## Customer Reviews

The Nature of Code addresses coding nature simulations in the Processing language. It covers real-world physics, using physics libraries (such as JBox2D), cellular automata, flocking and following behavior, and neural networking. While some of these subjects are daunting, Shiffman writes clearly, explains fundamental concepts, and leads the reader through each subject with code snippets and complete sketches. There are also specific chapter challenges and an overall, book-long coding challenge for the reader. This is not a beginner's book (see "Learning Processing"

for that), but a book that coders with some experience in Processing can use with ease and profit. Processing is not the ideal platform for game programming, but the first four chapters of this book present a solid physics background useful in any programming language, while the chapter on Physics libraries explains how to use physics engines, such as JBox2D, that were used in creation of famous apps like "Angry Birds". It would be of great use to aspiring games coders. The cellular automata and animal behavior chapters likewise would be of great use to coders working in robotics. This book would be a perfect text for a high-school level physics class, as students could quickly learn and apply principles of gravitational attraction, force application, and Newtonian physics to their own computer simulations. The processing language used is available at no cost, and the book's accompanying code examples are well documented and useful. Not all the exercises set for the reader are solved, but enough examples are provided to encourage the reader to explore further.

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