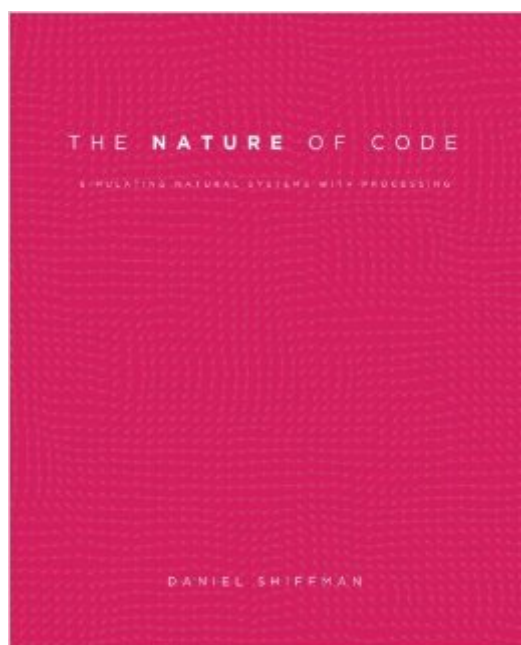# The Nature Of Code: Simulating Natural Systems With Processing

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

Paperback: 520 pages

Publisher: The Nature of Code; 1 edition (December 13, 2012)

Language: English

ISBN-10: 0985930802

ISBN-13: 978-0985930806

Product Dimensions: 7.5 x 1.2 x 9.2 inches

Shipping Weight: 2.4 pounds (View shipping rates and policies)

Average Customer Review: 4.8 out of 5 stars See all reviews (56 customer reviews)

Best Sellers Rank: #108,644 in Books (See Top 100 in Books)   #59 in Books > Computers & Technology > Games & Strategy Guides > Game Programming   #64 in Books > Computers & Technology > Programming > Algorithms   #166 in Books > Computers & Technology > Programming > Graphics & Multimedia

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.

The Nature of Code: Simulating Natural Systems with Processing Deep Learning: Natural Language Processing in Python with Recursive Neural Networks: Recursive Neural (Tensor) Networks in Theano (Deep Learning and Natural Language Processing Book 3) Deep Learning: Natural Language Processing in Python with GLoVe: From Word2Vec to GLoVe in Python and Theano (Deep Learning and Natural Language Processing) Deep Learning: Natural Language Processing in Python with Word2Vec: Word2Vec and Word Embeddings in Python and Theano (Deep Learning and Natural Language Processing Book 1) Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech Recognition Nature Designs: Amazing Natural Flowers and Women Patterns to Relax and Reduce Stress (nature sesigns, beautiful woman, natural patterns) Natural Gas Trading: From Natural Gas Stocks to Natural Gas Futures- Your Complete, Step-by-Step Guide to Natural Gas Trading Computational Explorations in Cognitive Neuroscience: Understanding the Mind by Simulating the Brain Building a SharePoint 2016 Home Lab: A How-To Reference on Simulating a Realistic SharePoint Testing Environment 2012 International Plumbing Code (Includes International Private Sewage Disposal Code) (International Code Council Series) Information Processing with Evolutionary Algorithms: From Industrial Applications to Academic Speculations (Advanced Information and Knowledge Processing) The Process of Creating Life: Nature of Order, Book 2: An Essay on the Art of Building and the Nature of the Universe (The Nature of Order)(Flexible) Natural Language Processing in Lisp: An Introduction to Computational Linguistics Functional Grammar in PROLOG (Natural Language Processing) Handbook of Natural Gas Transmission and Processing, Second Edition

Mastering Natural Language Processing with Python Natural Language Processing Natural Language Processing with Java and LingPipe Cookbook Natural Language Processing for Social Media (Synthesis Lectures on Human Language Technologies) Graph-based Natural Language Processing and Information Retrieval