

COMPUTER SCIENCE & ENGINEERING

FLUID ENGINE DEVELOPMENT

DOYUB KIM



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From the splash of breaking waves to turbulent swirling smoke, the mathematical dynamics of fluids are varied and continue to be one of the most challenging aspects in animation. **Fluid Engine Development** demonstrates how to create a working fluid engine through the use of particles and grids, and even a combination of the two. Core algorithms are explained from a developer's perspective in a practical, approachable way that will not overwhelm readers. The Code Repository offers further opportunity for growth and discussion with continuously changing content and source codes. This book helps to serve as the ultimate guide to navigating complex fluid animation and development.

KEY FEATURES:

- Explains how to create a fluid simulation engine from scratch
- Offers an approach that is code-oriented rather than math-oriented, allowing readers to learn how fluid dynamics works with code, with downloadable code available
- Explores various kinds of simulation techniques for fluids using particles and grids
- Discusses practical issues such as data structure design and optimizations
- Covers core numerical tools including linear system and level set solvers

ABOUT THE AUTHOR:

Doyub Kim is a senior engineer at Uber Maps Research team.

Doyub completed his B.S. and Ph.D. from Seoul National University. His doctoral research focused on physics-based animation and high-performance computing. After completing his doctoral study, he worked at Carnegie Mellon University as a post-doctoral researcher and U.C. Berkeley as a visiting researcher. Then he started his industry career at Microsoft to work on 3D maps, and later he joined Uber Maps Research team.

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Suite 300, Boca Raton, FL 33487
270 Madison Avenue
New York, NY 10016
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