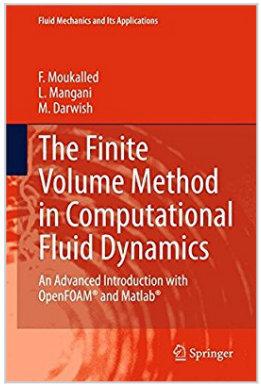

The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications)

By F. Moukalled, L. Mangani, M. Darwish

The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications) By F. Moukalled, L. Mangani, M. Darwish

This textbook explores both the theoretical foundation of the Finite Volume Method (FVM) and its applications in Computational Fluid Dynamics (CFD). Readers will discover a thorough explanation of the FVM numerics and algorithms used for the simulation of incompressible and compressible fluid flows, along with a detailed examination of the components needed for the development of a collocated unstructured pressure-based CFD solver. Two particular CFD codes are explored. The first is uFVM, a three-dimensional unstructured pressure-based finite volume academic CFD code, implemented within Matlab. The second is OpenFOAM®, an open source framework used in the development of a range of CFD programs for the simulation of industrial scale flow problems.

With over 220 figures, numerous examples and more than one hundred exercise on FVM numerics, programming, and applications, this textbook is suitable for use in an introductory course on the FVM, in an advanced course on numerics, and as a reference for CFD programmers and researchers.

The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications)

By F. Moukalled, L. Mangani, M. Darwish

The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications) By F. Moukalled, L. Mangani, M. Darwish

This textbook explores both the theoretical foundation of the Finite Volume Method (FVM) and its applications in Computational Fluid Dynamics (CFD). Readers will discover a thorough explanation of the FVM numerics and algorithms used for the simulation of incompressible and compressible fluid flows, along with a detailed examination of the components needed for the development of a collocated unstructured pressure-based CFD solver. Two particular CFD codes are explored. The first is uFVM, a three-dimensional unstructured pressure-based finite volume academic CFD code, implemented within Matlab. The second is OpenFOAM®, an open source framework used in the development of a range of CFD programs for the simulation of industrial scale flow problems.

With over 220 figures, numerous examples and more than one hundred exercise on FVM numerics, programming, and applications, this textbook is suitable for use in an introductory course on the FVM, in an advanced course on numerics, and as a reference for CFD programmers and researchers.

The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications) By F. Moukalled, L. Mangani, M. Darwish Bibliography

- Sales Rank: #64534 in Books
- Published on: 2015-08-14
- Original language: English
- Number of items: 1
- Dimensions: 1.88" h x 6.12" w x 9.47" l, .0 pounds
- Binding: Hardcover
- 791 pages

Editorial Review

Review

"The book is very attractive, carefully written and easy to read by those interested in learning about finite volume methods for fluid dynamics. The authors have made an important effort to bridge the gap between classroom material and actual model development questions. The text is well illustrated by means of quality figures helping to understand the described concepts. Furthermore, the book contains pieces of academic codes in MATLAB … . It is certainly a useful, practical and valuable book." (Pilar Garcia-Navarro, Mathematical Reviews, May, 2016)

From the Back Cover

This textbook explores both the theoretical foundation of the Finite Volume Method (FVM) and its applications in Computational Fluid Dynamics (CFD). Readers will discover a thorough explanation of the FVM numerics and algorithms used for the simulation of incompressible and compressible fluid flows, along with a detailed examination of the components needed for the development of a collocated unstructured pressure-based CFD solver. Two particular CFD codes are explored. The first is uFVM, a three-dimensional unstructured pressure-based finite volume academic CFD code, implemented within Matlab. The second is OpenFOAM®, an open source framework used in the development of a range of CFD programs for the simulation of industrial scale flow problems.

With over 220 figures, numerous examples and more than one hundred exercise on FVM numerics, programming, and applications, this textbook is suitable for use in an introductory course on the FVM, in an advanced course on numerics, and as a reference for CFD programmers and researchers.

About the Author

Fadl Moukalled received his PhD degree in Mechanical Engineering from Louisiana State University in 1987. During that same year he joined the Mechanical Engineering Department at the American University of Beirut where currently he serves as a Professor. He is research interests cover several aspects of the finite volume method and its use in computational fluid dynamics. A founding member of the CFD Group at AUB, he worked on convection schemes, pressure based segregated algorithms for incompressible and compressible flows, adaptive grid methods, multigrid methods, transient schemes for free surface flows, multiphase flows, and fully coupled pressure based solvers for incompressible, compressible, and multiphase flows.

Luca Mangani received his PhD degree form the University of Florence in 2006, where he worked on the development of a state-of-the-art turbo machinery code in OpenFOAM® for heat transfer and combustion analysis. After three years of post-doc work, he joined the Lucerne University of Applied Sciences and Arts as Senior Research and chief engineer for CFD simulations. Since 2014 he is serving as an Associate Professor at the fluid mechanics and hydro-machines department, where he manages a variety of projects with industrial partners aimed at developing advanced and novel CFD tools. His research interests include pressure and density-based solvers, segregated and fully coupled algorithms, fluid-structure interaction (FSI),

turbulence, and conjugate heat transfer modeling.

Marwan Darwish received his PhD degree in Materials Processing from BRUNEL University in 1991. He then joined the BICOM institute for one year as a post-doc before joining the Mechanical Engineering Department at the American University of Beirut in 1992, where he currently serves as a Professor. His research interest covers a range of topics including solidification, advanced numerics, free surface flow, high resolution schemes, multiphase flows, coupled algorithms, and algebraic multigrid. He is a founding member of the CFD Group at AUB.

Users Review

From reader reviews:

Norman Williams:

Why don't make it to become your habit? Right now, try to ready your time to do the important act, like looking for your favorite guide and reading a book. Beside you can solve your problem; you can add your knowledge by the book entitled The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications). Try to stumble through book The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications) as your pal. It means that it can being your friend when you feel alone and beside those of course make you smarter than ever. Yeah, it is very fortuned in your case. The book makes you a lot more confidence because you can know anything by the book. So , let's make new experience and also knowledge with this book.

Suzanne Jensen:

Have you spare time for the day? What do you do when you have a lot more or little spare time? That's why, you can choose the suitable activity with regard to spend your time. Any person spent all their spare time to take a wander, shopping, or went to the Mall. How about open or perhaps read a book entitled The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications)? Maybe it is for being best activity for you. You understand beside you can spend your time along with your favorite's book, you can smarter than before. Do you agree with their opinion or you have various other opinion?

Desiree Herdon:

The e-book with title The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications) includes a lot of information that you can learn it. You can get a lot of profit after read this book. That book exist new understanding the information that exist in this e-book represented the condition of the world right now. That is important to yo7u to know how the improvement of the world. That book will bring you with new era of the internationalization. You can read the e-book on your own smart phone, so you can read this anywhere you want.

Dennis Carson:

The book untitled The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications) contain a lot of information on it. The writer explains your girlfriend idea with easy means. The language is very straightforward all the people, so do not really worry, you can easy to read that. The book was compiled by famous author. The author brings you in the new age of literary works. It is possible to read this book because you can read on your smart phone, or program, so you can read the book within anywhere and anytime. In a situation you wish to purchase the e-book, you can start their official web-site along with order it. Have a nice study.

Read The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications) By F. Moukalled, L. Mangani, M. Darwish for online ebook

The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications) By F. Moukalled, L. Mangani, M. Darwish Free PDF d0wnl0ad, audio books, books to read, good books to read, cheap books, good books, online books, books online, book reviews epub, read books online, books to read online, online library, greatbooks to read, PDF best books to read, top books to read The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications) By F. Moukalled, L. Mangani, M. Darwish books to read online.

Online The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications) By F. Moukalled, L. Mangani, M. Darwish ebook PDF download

The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications) By F. Moukalled, L. Mangani, M. Darwish Doc

The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications) By F. Moukalled, L. Mangani, M. Darwish Mobipocket

The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications) By F. Moukalled, L. Mangani, M. Darwish EPub

DKZ9PHO51F6: The Finite Volume Method in Computational Fluid Dynamics: An Advanced Introduction with OpenFOAM® and Matlab (Fluid Mechanics and Its Applications) By F. Moukalled, L. Mangani, M. Darwish