

Lectures on Mean Curvature Flows

Author: Xi Ping Zhu
 ISBN:0-8218-3311-1
 Year Published: 2002
 Page: 150 pp
 Binding: Hardcover
 Price: \$39

Description

"Mean curvature flow" is a term used to describe the evolution of a hypersurface whose normal velocity is given by the mean curvature. In the simplest case of a convex closed curve on the plane, the properties of the mean curvature flow are described by Gage-Hamilton's theorem. This theorem states that under the mean curvature flow, the curve collapses to a point, and if the flow is diluted so that the enclosed area equals π , the

curve tends to the unit circle.

In this book, the author gives a comprehensive account of fundamental results on singularities and the asymptotic behavior of mean curvature flows in higher dimensions.

Among other topics, he considers in detail Huisken's theorem (a generalization of Gage-Hamilton's theorem to higher dimension), evolution of non-convex curves and hypersurfaces, and the classification of singularities of the mean curvature flow.

Because of the importance of the mean curvature flow and its numerous applications in differential geometry and partial differential equations, as well as in engineering, chemistry, and biology, this book will be useful to graduate students and researchers in those areas. The book would also make a nice supplementary text for an advanced course in differential geometry.

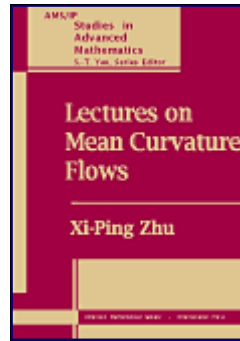


Table of Contents

1. The curve shortening flow for convex curves
2. The short time existence and the evolution equation of curvatures
3. Contraction of convex hypersurfaces
4. Monotonicity and self-similar solutions
5. Evolution of embedded curves or surfaces (I)
6. Evolution of embedded curves and surfaces (II)
7. Evolution of embedded curves and surfaces (III)
8. Convexity estimates for mean convex surfaces
9. Li-Yau estimates and type II singularities
10. The mean curvature flow in Riemannian manifolds
11. Contracting convex hypersurfaces in Riemannian manifolds
12. Definition of center of mass for isolated gravitating systems

Lectures on Systems, Control and Information: Lectures at the Morningside Center of Mathematics

Authors: Lei Guo and
 Stephen S.-T. Yau
 ISBN:0-8218-2009-5
 Year Published: 2000
 Page: 212 pp
 Binding: Softcover
 Price: \$49

Description

This volume presents lectures delivered at a workshop held at the Academy of Sciences (Beijing). The following articles are included: "Nonlinear Systems Control" by R. Brockett, "Adaptive Control of Discrete-Time Nonlinear Systems with Structural Uncertainties" by

L.-L. Xie and L. Guo, "Networks and Learning" by P. R. Kumar, "Mathematical Aspects of the Power Control Problem in Mobile Communication Systems" by C. W. Sung and W. S. Wong, and "Brockett's Problem on Nonlinear Filtering Theory" by S. S.-T. Yau.

Basic concepts and current research are both presented in this book. The volume offers a comprehensive and easy-to-follow account of many fundamental issues in this diverse field. It would be a suitable text for a graduate course on wireless communication.

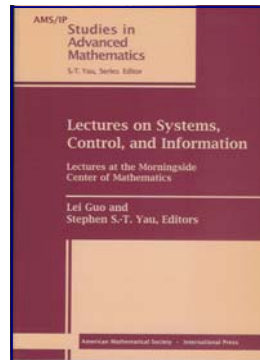


Table of Contents

1. R. Brockett ~ Beijing lectures on nonlinear control systems
2. L.-L. Xie and L. Guo ~ Adaptive control of discrete-time nonlinear systems with structural uncertainties
3. P. R. Kumar ~ Networks and learning
4. C. W. Sung and W. S. Wong ~ Mathematical aspects of the power control problem in mobile communication systems
5. Stephen S.-T. Yau ~ Brockett's problem on nonlinear filtering theory