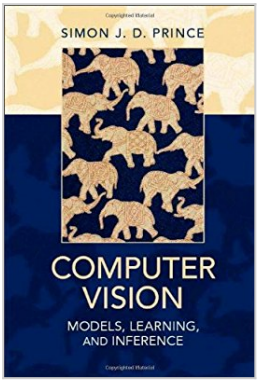

Computer Vision: Models, Learning, and Inference

By Dr Simon J. D. Prince

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This modern treatment of computer vision focuses on learning and inference in probabilistic models as a unifying theme. It shows how to use training data to learn the relationships between the observed image data and the aspects of the world that we wish to estimate, such as the 3D structure or the object class, and how to exploit these relationships to make new inferences about the world from new image data. With minimal prerequisites, the book starts from the basics of probability and model fitting and works up to real examples that the reader can implement and modify to build useful vision systems. Primarily meant for advanced undergraduate and graduate students, the detailed methodological presentation will also be useful for practitioners of computer vision. - Covers cutting-edge techniques, including graph cuts, machine learning, and multiple view geometry. - A unified approach shows the common basis for solutions of important computer vision problems, such as camera calibration, face recognition, and object tracking. - More than 70 algorithms are described in sufficient detail to implement. - More than 350 full-color illustrations amplify the text. - The treatment is self-contained, including all of the background mathematics. - Additional resources at www.computervisionmodels.com.

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Editorial Review

Review
"Computer vision and machine learning have gotten married and this book is their child. It gives the machine learning fundamentals you need to participate in current computer vision research. It's really a beautiful book, showing everything clearly and intuitively. I had lots of 'aha!' moments as I read through the book. This is an important book for computer vision researchers and students, and I look forward to teaching from it."
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"With clarity and depth, this book introduces the mathematical foundations of probabilistic models for computer vision, all with well-motivated, concrete examples and applications. Most modern computer vision texts focus on visual tasks; Prince's beautiful new book is natural complement, focusing squarely on fundamental techniques, emphasizing models and associated methods for learning and inference. I think every serious student and researcher will find this book valuable. I've been using draft chapters of this remarkable book in my vision and learning courses for more than two years. It will remain a staple of mine for years to come."
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"This book addresses the fundamentals of how we make progress in this challenging and exciting field. I look forward to many decades with [this book] on my shelf, or indeed, I suspect, open on my desktop."
from the Foreword by Andrew Fitzgibbon

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Jeffrey Putnam, Computing Reviews

About the Author
Dr Simon J. D. Prince is a faculty member in the Department of Computer Science at University College London. He has taught courses on machine vision, image processing and advanced mathematical methods. He has a diverse background in biological and computing sciences and has published papers across the fields of computer vision, biometrics, psychology, physiology, medical imaging, computer graphics and HCI.

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