



Video Tracking: Theory and Practice

By Emilio Maggio, Andrea Cavallaro

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Video Tracking provides a comprehensive treatment of the fundamental aspects of algorithm and application development for the task of estimating, over time, the position of objects of interest seen through cameras. Starting from the general problem definition and a review of existing and emerging video tracking applications, the book discusses popular methods, such as those based on correlation and gradient-descent. Using practical examples, the reader is introduced to the advantages and limitations of deterministic approaches, and is then guided toward more advanced video tracking solutions, such as those based on the Bayes' recursive framework and on Random Finite Sets.

Key features:

- Discusses the design choices and implementation issues required to turn the underlying mathematical models into a real-world effective tracking systems.
- Provides block diagrams and simil-code implementation of the algorithms.
- Reviews methods to evaluate the performance of video trackers – this is identified as a major problem by end-users.

The book aims to help researchers and practitioners develop techniques and solutions based on the potential of video tracking applications. The design methodologies discussed throughout the book provide guidelines for developers in the industry working on vision-based applications. The book may also serve as a reference for engineering and computer science graduate students involved in vision, robotics, human-computer interaction, smart environments and virtual reality programmes

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Editorial Review

Review

"The design methodologies discussed throughout the book provide guidelines for developers in the industry working on vision-based applications. The book may also serve as a reference for engineering and computer science graduate students involved in vision, robotics, human-computer interaction, smart environments and virtual reality programs." (Zentralblatt MATH, 2011)

"While technical, the text is clearly written and supported by exceptional illustrations." (Booknews, 1 June 2011)

From the Back Cover

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About the Author

Dr Emilio Maggio, Vicon, UK

Dr Maggio is Computer Vision Scientist at Vicon, the motion capture worldwide market leader. From 2004 – 2008 he was a Ph.D. student at the Department of Electronic Engineering, Queen Mary, University of London. In 2005 and again in 2007 he was awarded the best student paper prize at ICASSP. Dr Maggio has acted as a reviewer for the IEEE Transactions on Circuits and Systems for Video Technology, the *International Journal of Image and Graphics* and *ACM Multimedia*.

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author of more than 70 papers, including 5 book chapters. He is an elected member of the IEEE Signal Processing Society, Multimedia Signal Processing Committee. He has been a member of the organizing/technical committee for several international conferences such as Technical Chair of EUSIPCO 08 and General Chair of the IEEE International Conference on Advanced Video and Signal based Surveillance (AVSS 2007), with General Chair positions being held for forthcoming 2009 conferences such as BMVC 09. He has been guest editor of several special issues, including 'Multi-sensor object detection and tracking', *Signal, Image and Video Processing* (Springer). Dr Cavallaro was awarded the Royal Academy of Engineering teaching prize in 2007.

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