



# Communicating Pictures: A Course in Image and Video Coding

*David R. Bull*

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*Communicating Pictures* starts with a unique historical perspective of the role of images in communications and then builds on this to explain the applications and requirements of a modern video coding system. It draws on the author's extensive academic and professional experience of signal processing and video coding to deliver a text that is algorithmically rigorous, yet accessible, relevant to modern standards, and practical. It offers a thorough grounding in visual perception, and demonstrates how modern image and video compression methods can be designed in order to meet the rate-quality performance levels demanded by today's applications, networks and users. With this book you will learn:

- Practical issues when implementing a codec, such as picture boundary extension and complexity reduction, with particular emphasis on efficient algorithms for transforms, motion estimators and error resilience
- Conflicts between conventional video compression, based on variable length coding and spatiotemporal prediction, and the requirements for error resilient transmission
- How to assess the quality of coded images and video content, both through subjective trials and by using perceptually optimised objective metrics
- Features, operation and performance of the state-of-the-art High Efficiency Video Coding (HEVC) standard

  

- Covers the basics of video communications and includes a strong grounding in how we perceive images and video, and how we can exploit redundancy to reduce bitrate and improve rate distortion performance
- Gives deep insight into the pitfalls associated with the transmission of real-time video over networks (wireless and fixed)
- Uses the state-of- the-art video coding standard (H.264/AVC) as a basis for algorithm development in the context of block based compression
- Insight into future video coding standards such as the new ISO/ITU High Efficiency Video Coding (HEVC) initiative, which extends and generalizes the H.264/AVC approach



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