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*Short biography.* Stefan Rüger joined The Open University’s Knowledge Media Institute in 2006 to take up a chair in Knowledge Media. Before that he was a Reader in Multimedia and Information Systems at the Department of Computing, Imperial College London, where he also held an EPSRC Advanced Research Fellowship (1999–2004). Stefan is a theoretical physicist by training (FU Berlin) and received his PhD in Computing in 1996 from TU Berlin for his work on artificial intelligence and, in particular, the theory of neural networks. Since then he has made a continuous journey from theory to its applications in multimedia retrieval. In 2009 he was awarded a Honorary Professorship (until 2014) at the University of Waikato for his work with the Greenstone Digital Library group and is currently a visiting fellow at Cranfield University, UK.

Stefan chaired ECIR 2006 and ECIR 2010, co-chaired ICTIR 2009, was programme chair of IRFC 2010, programme co-chair of WI 2010, ECIR 2013, is currently programme co-chair of RuSSIR 2013 and WI 2013, and has been asked to be programme co-chair of ICMR 2014. He acts as associate editor for three journals and has been reviewing for 32 other Computing journals, 70 international conferences and 15 research funders including the Commission of the European Communities and the European Research Council. Stefan is a Fellow of the Higher Education Academy in the UK; a member of the EPSRC College, ACM and BCS; and of the BCS Specialist Group for Information Retrieval. During his academic career he and his team have authored over 100 scientific publications in the area of multimedia information retrieval. For further information and publications see http://people.kmi.open.ac.uk/stefan.

*Teaching.* Stefan has been teaching since 1994 and obtained a postgraduate qualification “Certificate of Advanced Studies in Learning and Teaching” in 2002 following a formal one-year part-time postgraduate study at Imperial College London. He taught undergraduate courses and MSc courses to university students, and compact courses to business consultants, who participated in a part-time MSc programme “Computing in Industry” while continuing to work. Stefan’s teaching and tutorial style is unconventional in the sense that he delivers a fully worked-out script with his slides and loosens up lectures with discussion points and exercises for which he gets the class to actively participate. Normally, Stefan receives many favourable comments from the participants in post-tutorial evaluation. For example, the multimedia information retrieval module that Stefan delivered at the European Summer School in IR in 2009 elicited an average score of 3.5 and a median score of 4 on the range 1–4 from 110 participant feedback forms (communicated by the organisers Massimo Melucci and Ricardo Beaza-Yates). He has delivered tutorials at international conferences, at Summer Schools (twice ESSIR and twice RuSSIR), and a lecture series at the National Institute of Informatics, Japan.

**Multimedia information retrieval — abstract**

At its very core multimedia information retrieval means the process of searching for and finding multimedia documents; the corresponding research field is concerned with building the best possible multimedia search engines to support digital libraries and resource discovery missions. The intriguing bit here is that the query itself can be a multimedia excerpt: For example, when
looking at a sketch in a text book, slide presentation or patent application, would it not be great if you could just take a picture with your mobile phone and send it to a service that finds a related sketched in, say, a database of lecture videos covering that topic or the patent database?

This tutorial goes further by examining the full matrix of a variety of query modes versus document types. How do you retrieve a music piece by humming? What if you want to find news video clips on forest fires using a still image? The tutorial discusses underlying techniques and common approaches to facilitate multimedia search engines: metadata driven retrieval; piggy-back text retrieval where automated processes create text surrogates for multimedia; automated image annotation; content-based retrieval. The latter is studied in great depth looking at features and distances, and how to effectively combine them for efficient retrieval, to a point where the participants will develop an understanding of possibilities and limitations of multimedia search engines.

Supporting users in their resource discovery mission when hunting for multimedia material is not a technological indexing problem alone. We look at interactive ways of engaging with repositories through browsing and relevance feedback, roping in geographical context, and providing visual summaries for videos. The tutorial emphasises state-of-the-art research in the area of multimedia information retrieval, which gives an indication of the research and development trends and, thereby, a glimpse of the future world.

Intended audience. Practitioners and researchers, who want to get an overview of multimedia retrieval

Duration. Half day: 3 hours

Aims. To introduce a wide range of computerised content-based techniques for organising digital multimedia documents and searching in them (metadata driven, piggy-back text retrieval, content-based retrieval, automated image annotation and fingerprinting); to make the participants familiar with the particular advantages, disadvantages and challenges of these techniques. This part of the tutorial considers video, image and music data under the perspective of querying, representing and retrieving.

Objectives. At the end of the tutorial the participants will be able to

- Outline challenges brought about by multimedia collections and their interface needs
- Describe the principle components of a multimedia information retrieval system and how they differ from other retrieval systems, most notably text information retrieval systems
- Describe and implement simple visual feature vectors commonly used in image search engines
- Explain the workings of an image search engine and relate this to other media types


Outline. Basically, the tutorial covers chapters 1 and 2 of the book with chapters 3 and 4 suited for later self study. Chapter 5 is meant as a reference only and does not need to be discussed in the tutorial (except for the TRECVid, ImageCLEF and other evaluation campaigns).

Presentation format. The suggested form of the tutorial is a slide presentation that discusses and illustrates the themes above interspersed with discussion points and and jointly going through worked examples. This format serves loosening up the tutorial, making the material more transparent, adding value to reading the book alone (that does not discuss solutions to the exercises), and thus becoming an interactive experience.