# Image and Natural Language Processing for Multimedia Information Retrieval

Mirella Lapata

School of Informatics
University of Edinburgh
mlap@inf.ed.ac.uk

**Abstract.** Image annotation, the task of automatically generating description words for a picture, is a key component in various image search and retrieval applications. Creating image databases for model development is, however, costly and time consuming, since the keywords must be hand-coded and the process repeated for new collections. In this work we exploit the vast resource of images and documents available on the web for developing image annotation models without any human involvement. We describe a probabilistic framework based on the assumption that images and their co-occurring textual data are generated by mixtures of latent topics. Applications of this framework to image annotation and retrieval show performance gains over previously proposed approaches, despite the noisy nature of our dataset. We also discuss how the proposed model can be used for story picturing, i.e., to find images that appropriately illustrate a text and demonstrate its utility when interfaced with an image caption generator.

**Biography**: Mirella Lapata is a Reader at the School of Informatics at the University of Edinburgh. She received an MA from Carnegie Mellon University and a PhD in Natural Language Processing from the University of Edinburgh. She has held appointments at the Department of Computational Linguistics at Saarland University (Saarbruecken) and at the Department of Computer Science in Sheffield. She has worked on various problems in natural language processing, mostly with an emphasis on statistical methods and generation applications. Her current research interests include the use of integer linear programming for summarization, topic models for image retrieval, automated story generation, and probabilistic models of semantic representation. She has published broadly in leading NLP and AI conferences and journals and was two times recipient of the best paper award at EMNLP. She has received an Advanced Research Fellowship and several project grants from EPSRC (the UK Engineering and Physical Sciences Research Council) and has served on the programme committee of major NLP, AI and machine learning conferences.