

Coding and Information Transmission Research Group

Research topic

Context-based recompression of JPEG coded images

The JPEG (Joint Experts Pictures Group) standard was adopted in 1992. In spite of existence of more efficient standards for image compression (for example, JPEG2000 and JPEG-XR), nowadays JPEG is one of the most popular digital standards used for representing colour images in a compact form. One of the reasons for its popularity is that JPEG compression is commonly used in digital photo cameras. Practically every modern digital camera has inbuilt compression algorithm which stores images in JPEG. With improving resolutions of the digital photos, it becomes more and more difficult to find on the market a digital camera using so-called “raw format”, that is, without compression.

There exists a necessity to store a large number of existing digital photos, which generates a problem of representing them in a more compact form. Since JPEG compression causes information loss, a straightforward approach based on reconstruction of the original image followed by compression using more efficient standards is not applicable. On the other hand, universal lossless coding techniques which do not take into account statistical properties of images are also not efficient. Context-based arithmetic coding is one of the most efficient lossless compression techniques which can be efficiently used for recompression JPEG coded images.

In this project, the student will develop and implement an efficient algorithm for recompression of JPEG coded images using context-based arithmetic coding. The project can be first taken as MTAT.07.027 Special Assignment in Coding Theory and later extended to Master’s thesis.

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