

## Image Compression with Partial Differential Equations

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While partial differential equations (PDEs) have many fascinating applications in image processing, their usefulness for lossy image compression has hardly been studied so far. In this talk we show that PDEs have a high potential to become alternatives to modern compression standards such as JPEG and JPEG 2000.

The idea sounds temptingly simple: We keep only a small amount of the pixels and reconstruct the remaining data with PDE-based interpolation. This gives rise to three interdependent questions:

1. Which are the best data for being kept?
2. What are the most useful PDEs for data interpolation?
3. How can the selected data be encoded in an efficient way?

Solving these problems requires to combine ideas from different mathematical disciplines such as mathematical modelling, shape optimisation, discrete optimisation, interpolation and approximation, and numerical methods for PDEs.

Since the talk is intended for a broad audience, we focus on the main ideas, and no specific knowledge in image processing is required.