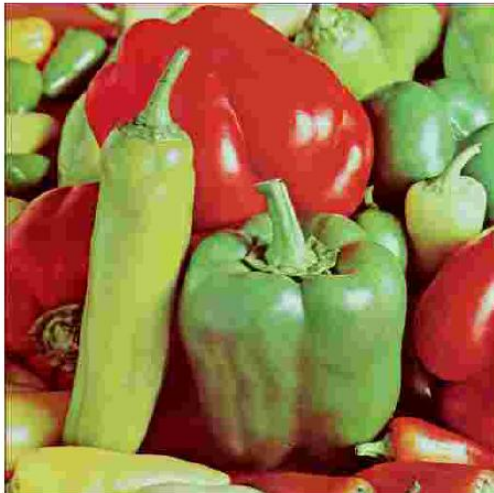


## Software: Artifact-Free JPEG Decompression

JPEG is the most common lossy compression standard for digital images. It allows a high compression rate but leads to artifacts in the standard reconstruction due to loss of image data. Our TGV-based method allows to obtain a highly improved reconstruction of any given JPEG compressed image. It removes noise and yields a clean image without over-smoothing sharp edges.

### Background



Standard reconstruction.



TGV-based reconstruction.

### Technology

The reconstruction of JPEG compressed images, based on TGV (total generalized variation), uses any given JPEG file to uniquely determine the set of all possible source images. The method then applies the TGV functional to particularly choose one of these possible source images and with that obtain a highly improved reconstruction. This is realized by an iterative process. The constructed image can then be displayed or saved to hard disk in higher quality. The fast reconstruction method has already been implemented in parallel not only for CPU but also for the GPU.

### Benefits of the Technology

- Highly improved reconstruction of JPEG compressed images
- Reconstruction always fits to the given data
- Iterative Process that can be stopped at any time
- No over-smoothing of the image
- Parallel computing by using GPU and/or CPU

### Potential Applications

- Display highly improved reconstructions of compressed digital images
- Photo editing software
- Reconstruct images from highly compressed image data

### Development Status

Fully working software using TGV - also based on GPU computing - has been developed.

### Status of Patent

European Patent is pending.

### Cooperation Options

License Agreement, Assignment

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**Our Reference: JPEG TGV Decompression**

University of Graz  
Institute for Mathematics and Scientific  
Computing  
[http://www.kfunigraz.ac.at/imawww/index\\_e.html](http://www.kfunigraz.ac.at/imawww/index_e.html)