Elektrotechnik-Elektronik-Informationstechnik

EEI KOLLOQUIUM

Computational Imaging

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Diskussionsleitung: Prof. Dr.-Ing. R. Müller

Computational Imaging lies at the cross section of various disciplines including machine learning, classical image and signal processing, physical optics, computer vision and computer graphics. What makes it different from its constituents is its integrated, interdisciplinary approach. Every so often it would question established, traditional approaches, often leading to fast progress and novel solutions to longstanding problems.

A prime example of this paradigm that I'm going to present in this talk is blind image deconvolution which has enjoyed much attention and progress in the last decade. In particular I will first give an introduction to the problem before devising a novel imaging model that takes inspiration from classical audio processing and which enables fast removal of non-uniform camera shake as well as optical aberration correction. In addition, I will present a learning-based approach to blind image deconvolution. It uses a deep layered architecture, parts of which are borrowed from recent work on neural network learning, and parts of which incorporate computations that are specific to image deconvolution. Our proposed system is trained end-to-end on a set of artificially generated training examples, enabling competitive performance in blind deconvolution, both with respect to quality and runtime.