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Seminar

Bilevel Learning of Variational Regularisation Models

Professor Carola-Bibiane Schönlieb

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Abstract

When assigned with the task of reconstructing an image from imperfect data the first challenge one faces is the derivation of a truthful image and data model. In the context of regularized reconstructions, some of this task amounts to selecting an appropriate regularisation term for the image, as well as an appropriate distance function for the data fit. This can be determined by the a-priori knowledge about the image, the data and their relation to each other. The source of this knowledge is either our understanding of the type of images we want to reconstruct and of the physics behind the acquisition of the data or we can thrive to learn parametric models from the data itself. The common question arises: how can we optimize our model choice?

In this talk we discuss a bilevel optimization method for learning optimal variational regularisation models. Parametrising the regularisation and data fidelity terms, we will learn optimal total variation type regularisation models for image and video de-noising, and optimal data fidelity functions for pure and mixed noise corruptions. I will also give an outlook on how such an approach can be used to learn optimal sampling patterns for magnetic resonance omography, and for decomposing a video into its spatial and temporal components.

This is joint work with M. Benning, L. Calatroni, C. Chung, J. C. De Los Reyes, M. Ehrhardt, G. Maierhofer, T. Valkonen, and V. Vlacic

Date :	September 28, 2016 (Wednesday)
Time :	4:30p.m. – 5:30p.m.
Venue :	C4, Lady Shaw Building, The Chinese University of Hong Kong

All are Welcome