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KEYNOTE TALK
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Convex Optimization Methods for Computer Vision

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Abstract

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Numerous computer vision problems can be solved by variational methods and partial differential equations. Yet, many traditional approaches correspond to non-convex energies giving rise to suboptimal solutions and often strong dependency on appropriate initialization. In my presentation, I will show how problems like image segmentation, multiview stereo reconstruction and optic flow estimation can be formulated as variational problems. Subsequently, I will introduce methods of convexification which allow to compute globally optimal or near-optimal solutions which are independent of initialization. Experimental results demonstrate that these spatially continuous approaches provide numerous advantages over spatially discrete (graph cut) formulations, in particular they are easily parallelized (lower runtime), they require less memory (higher resolution) and they do not suffer from metrication errors (better accuracy).

Speaker Bio-Sketch: Daniel Cremers received Bachelor degrees in Mathematics (1994) and Physics (1994), and a Master's degree in Theoretical Physics (1997) from the University of Heidelberg. In 2002 he obtained a PhD in Computer Science from the University of Mannheim, Germany. Subsequently he spent two years as a postdoctoral researcher at the University of California at Los Angeles (UCLA) and one year as a permanent researcher at Siemens Corporate Research in Princeton, NJ. From 2005 until 2009 he was associate professor at the University of Bonn, Germany. Since 2009 he holds the chair for Computer Vision and Pattern Recognition at the Technical University, Munich. His publications received several awards, including the award of Best Paper of the Year 2003 by the Int. Pattern Recognition Society and the 2005 UCLA Chancellor's Award for Postdoctoral Research. In December 2010 the magazine Capital listed Prof. Cremers among "Germany's Top 40 Researchers Below 40".