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A Hilbert Scheme in Computer Vision

Chris Aholt, Bernd Sturmfels, Rekha Thomas

(Submitted on 14 Jul 2011)

Multiview geometry is the study of two-dimensional images of three-dimensional scenes, a foundational subject in computer vision. We determine a universal Groebner basis for the multiview ideal of n generic cameras. As the cameras move, the multiview varieties vary in a family of dimension 11n-15. This family is the distinguished component of a multigraded Hilbert scheme with a unique Borel-fixed point. We present a combinatorial study of ideals lying on that Hilbert scheme.

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