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Gunnar Fløystad and **Joe Kileel*** (jkileel@math.berkeley.edu), Department of Mathematics, UC Berkeley, CA 94720, and **Giorgio Ottaviani**. *The Chow form of the essential variety in computer vision.*

In computer vision, 3D reconstruction is a fundamental task: starting from photographs of a world scene, taken by cameras in unknown positions, how can we best create a 3D model of that world scene? Algorithms for this are used in Street View (Google Maps) and are embedded in every smart phone. In this talk, we will introduce and answer a basic mathematical problem when the number of cameras is two, left open by Googler Agarwal and his co-authors.

The answer is a determinantal formula for the Chow form of the configuration space of two calibrated cameras, which is a five-dimensional variety in \mathbb{P}^8 . It is in the spirit of classical Bézoutian formulas for resultants, but we need representations of GL_4 and the modern theory of Ulrich sheaves to derive it. I will show some examples from numerical linear algebra to illustrate the utility of the result. (Received February 12, 2016)