1128-68-352 **Sudipta N Sinha*** (sudipta.sinha@gmail.com), One Microsoft Way, Redmond, WA 98052. *A brief tour of optimization methods used in 3D computer vision.*

3D scene reconstruction from multiple images is a fundamental topic in computer vision which has witnessed rapid progress in the last two decades. It involves recovering 3D shape, appearance and motion of objects in imagery and requires solving a range of parameter estimation problems that are typically formulated as optimization problems. Many vision problems are inherently ill-posed and require appropriate regularization to deal with noise and ambiguities in the input.

I will briefly review applications of nonlinear continuous optimization for geometric problems such as structure from motion and dense 3D reconstruction. I will also discuss discrete and continuous energy minimization methods used in low-level vision tasks such as stereo matching and optical flow estimation which involve assigning each image pixel a suitable label. Such pixel labeling tasks are naturally formulated as optimization problems which are equivalent to maximum a posteriori (MAP) estimation of Markov Random Field models.

I will also describe my recent work with Tatsunori Taniai and Yoichi Sato from University of Tokyo on MAP inference on hierarchical Markov Random Fields motivated by the task of joint recovery of dense semantic correspondence and cosegmentation in pairs of images. (Received March 01, 2017)