THE UNIVERSITY OF CHICAGO

COMPUTATIONAL AND APPLIED MATHEMATICS STUDENT SEMINAR

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Graph-Based Methods for Inverse Problems on Manifolds and Point Clouds

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via ZOOM

ABSTRACT

We consider the inverse problem of determining the diffusion coefficient of a second-order elliptic partial differential equation in a manifold from noisy measurements of the solution. Motivated by manifold learning techniques, we replace the differential representation of the forward map with a kernel-based integral operator that may be discretized on a point cloud without reference to the Riemannian metric. We establish error bounds of the approximate solution and demonstrate effectiveness of the approach through numerical experiments.