**MARCIO GAMEIRO**, University of São Paulo at São Carlos
*Continuation of Point Clouds via Persistence Diagrams*

We present a mathematical and algorithmic framework for the continuation of point clouds via persistence diagrams. We show that the persistence map, which assigns a persistence diagram to a point cloud, is differentiable. This allows us to apply the Newton-Raphson continuation method in this setting. Given an initial point cloud P and a its corresponding persistence diagram PD, we apply continuation to find a new point cloud P' close to P, that have a prescribed persistence diagram PD' close to PD. We present algorithms to perform the continuation as well as some computational results. This is joint work with Yasuaki Hiraoka (WPI-AIMR, Tohoku University) and Ippei Obayashi (WPI-AIMR, Tohoku University).