
HUI OUYANG, UBC Okanagan

Circumcenters of finite sets with applications in Hilbert spaces

First, we present basic results and properties of the circumcenter of sets containing finitely many points in Hilbert space. This is motivated by two papers of Behling, Bello Cruz, and Santos on accelerated versions of the Douglas–Rachford method. Then we introduce two new notions: circumcenter mapping induced by operators and the properness of the circumcenter mapping. Some properties of the circumcenter mapping will be given. Finally, we talk about the applications of the proper circumcenter mappings. Several examples are provided to illustrate the tightness of various assumptions. In particular, the performance profile is used to compare the convergence rate of some of our proper circumcenter mappings with that of the method of alternating projections and the Douglas–Rachford method.