The power of the reach in set reconstruction

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Much of contemporary research in geometry focuses on C^2 manifolds. This assumption is convenient, as it permits the use of the full machinery of differential and Riemannian geometry. However, many configurations encountered in modern modeling software—as well as the majority of manufactured objects—do not admit a C^2 structure and may not even qualify as manifolds. To study the geometric properties of such objects, the community is working toward the development of tools that are independent of smoothness or even manifold structure. Among the most widely used tools in this context are the medial axis and reach. In my talk, I will illustrate their application across various settings and present three projects where these concepts play a central role in set reconstruction.