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Quantitative differentiability and rectifiability

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Differentiability and rectifiability describe whether a function or a set can be approximated by affine functions or planes, but both of these notions are infinitesimal, i.e., they deal with the properties of limits. Notions like uniform rectifiability let us quantify differentiability by considering approximations at scales that are small but positive. In this minicourse, we will explain how these ideas let us answer questions like “How well can a function or a set be approximated by affine functions or planes at local scales?” or “How often can a function or set fail to be approximated by an affine function or plane?”, and we will apply these ideas to geometry and analysis in Euclidean space and the Heisenberg group.

Presenter: YOUNG, Robert (New York University)