## **Barycentric Interpolation**

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## Abstract

In 1801 Carl Friedrich Gauß was able to correctly predict the future location of the newly discovered asteroid Ceres by applying his famous method of least squares, which continues to be one of the most important approximation algorithms, in particular in the presence of measurement errors. However, often the available data is precise and should be interpolated, and there exist an abundance of methods for doing so, including radial basis functions and splines. In this talk I will focus on the method of barycentric interpolation, which ties up to the ideas that August Ferdinand Möbius published in his seminal work Der barycentrische Calcül in 1827. For univariate data, this gives a special kind of rational interpolant which is guaranteed to have no poles and favorable approximation properties. I further discuss how to extend this idea to bivariate data, where it leads to the concept of generalized barycentric coordinates and to an efficient method for interpolating data given at the vertices of an arbitrary polygon.