More than sparse interpolation: applications in signal processing and beyond

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A mathematical model is called sparse if it can be represented by only a few non-zero terms. In computer algebra, the aim of sparse interpolation is to determine such a model from a small number of samples. Sparse techniques solve the problem statement from a number of samples proportional to the number of terms in the representation, rather than the number of available data points or available generating elements. Sparse representations reduce the complexity in several ways: data collection, algorithmic complexity and model complexity.

In recent years, the interesting connections between sparse polynomial interpolation, exponential analysis and rational approximation have led to significant progress in several signal processing applications. Overall, they have offered new possibilities for extracting generating components and detecting structural changes in many data analysis challenges.