Convergence Speeds of Numerical Methods

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In literature the convergence speed is defined differently for iterative methods, discretization methods and other numerical methods. In this talk we like to unify and classify all types of convergence and compare their speeds. We develop a scheme to decide the convergent type of given data. The issue of superconvergence and acceleration deserve more investigation for every numerical method. As a typical example in numerical solutions of differential equations, we observe the super-geometric convergence of many methods, including spectral method, Trefftz method, Kansa's method, and power series, etc.