

# Regularity and conditioning of variational problems

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While the concept of conditioning is well understood in numerical linear algebra and preconditioning techniques are widely used in scientific computing, still little is known in that direction for problems beyond equations, and in particular for variational problems, finite- and infinite-dimensional, where the presence of constraints complicates considerably the analysis.

In recent years it has become clear that the basic paradigm behind conditioning, the "distance to good behavior", can be extended to a vast variety of problems, linking it in one general picture with the development of error bounds measuring the effect of perturbations and approximations of a problem on its solutions as well as with estimation of convergence rate of algorithms.

The "good behavior" of a problem is usually understood as a regularity property which describes desirable features of the solutions. This talk is centered around properties of metric regularity which play major roles in various developments in classical and modern analysis.