WALAA MOURSI, University of British Columbia

Generalized solutions for the sum of two maximally monotone operators.

A common theme in mathematics is to define generalized solutions to deal with problems that potentially do not have solutions. A classical example is the introduction of least squares solutions via the normal equations associated with a possibly infeasible system of linear equations. In this talk, we introduce a "normal problem" associated with finding a zero of the sum of two maximally monotone operators. If the original problem admits solutions, then the normal problem returns this same set of solutions. The normal problem may yield solutions when the original problem does not admit any; furthermore, it has attractive variational and duality properties. Several examples illustrate our theory.