Fuzzy Optimization

Robert Wichmann

December 15, 2015

Since its invention by Lofti A. Zadeh in 1965 fuzzy mathematics has entered a wide range of fields. The idea to depart from classical logic with truth parameters in $\{0, 1\}$ and to generalize this to the real interval $[0, 1]$ raises a lot of questions. After defining how one can work with sets whose elements only have a degree of membership that lies in $[0, 1]$, it will be of interest to analyse opimization problems within this set up.
Fuzzy constraints in mathematical problems can be interpreted as a generalization of feasibility which then can be handled as a new parameter. On the other hand fuzziness in data is related to uncertainty. Therefore some approaches for dealing with fuzzy optimization problems will be discussed and compared to robust optimization concepts.