

# Seminar

## Prof. Alain Zemkoho

University of Southampton, UK

### Topic

Levenberg-Marquardt-type Methods for Bilevel Optimization

### Date | Time

19 April 2024 (Friday) | 16:00 – 17:00 (HK Time)

### Venue

FJ301, Main Campus

### Abstract

We consider the bilevel optimization problem in a very general setting, where the follower (or lower-level player) is free to choose whatever optimal solution that they want if their optimal solution set is not necessarily unique under some choices of the leader (or upper-level player). As it is well-known in the literature, this framework gives rise to the optimistic and pessimistic bilevel optimization problems, as tractable decision-making setups. In this talk, we consider both the optimistic and pessimistic scenarios of the problem and use the lower-level optimal value function reformulation to transform the follower's problem into inequality constraints. We then discuss approaches to write necessary optimality conditions of these problems, which are amenable to tractable numerical methods. It turns out that in each case, these optimality conditions can be rewritten as overdetermined or squared systems of equations. We will therefore discuss smoothing and nonsmooth-types Levenberg-Marquardt methods to solve these equations and report on the very promising numerical results obtained.

**ALL ARE WELCOME**