

**Title:** On the benefits of interacting agents in optimization

**Abstract:** Using independent runs of an optimization algorithm is a standard scheme for finding the minimizer of an objective function. In this talk we discuss how to improve this practice by allowing the different optimizers to interact. Two questions arise.

First: what are the benefits of letting agents interaction?

Second: how can one choose the interaction structure that will result in the fastest convergence while maintaining minimal communication costs?

To investigate this issue we formulate it through the optimization of the spectral gap of interacting Langevin dynamics and analyse its convergence using tools from both optimization and sampling. We present numerical results in convex and nonconvex (deep learning) settings.