Abstract:

Mathematical modelling and discrete optimization algorithms are very helpful for planning activities in educational institutions. They contribute to improve the pedagogical offer by removing feasibility constraints to, for example, personalized curricula and student preferences. The progress in optimization algorithms makes it possible nowadays to easily model and solve some combinatorial problems that arise in this context. In the talk I will briefly report about successful applications in project assignment and small size course timetabling. In other cases, like in curricula construction and large size course timetabling, models lead to problems that remain challenging from the computational point of view. In these cases, a need arises to develop ad hoc heuristic algorithms whose implementation is made complicated by many possible design choices.

The problem of deciding the best configuration of algorithm components and parameters can also be modelled as an optimization problem with stochastic elements. In the talk, I will present a recent proposal to solve this problem by means of importance sampling and Bayesian learning techniques and report preliminary computational results that are promising.