

Montreal CPLEX PhD School - Tentative detailed Sche...

Time: June 22nd afternoon and June 23rd all day.

Venue: To be filled by Carlos

Speakers:

- Pierre Bonami - Software Scientist - CPLEX Optimizer - [@pobonomo](#)
- Domenico Salvagnin - Consultant CPLEX and Assistant Professor University of Padova - [@dominiqs81](#)
- Andrea Tramontani - Software Scientist - CPLEX Optimizer - [@AndreaOmarT](#)

Tentative schedule:

The schedule below is for indication and we might not follow it exactly. In particular for Friday, in case we run a bit late please be prepared to stay until 6.30pm.

June 22nd:

02.30pm-4.15pm

CPLEX overview:

- Problem types you can solve with CPLEX
- Overview of CPLEX parallel branch-and-cut
- Overview of CPLEX API's

The Asymmetric Traveling Salesman Problem with Time Windows

- Problem definition
- The big-M MILP formulation
- Preprocessing
- Cutting planes

(break)

4.30pm-6.30pm

Using CPLEX to solve the big-M formulation of TSPTW

- Review the notebook to create the model with docplex.
- Test on few benchmarks instances. (lab)
- Numerical problems and their solution. (lab)
- Review the same code with the C APIs

June 23rd:

9.30am-12.30pm

Separating cuts on the fly using CPLEX callbacks (lab session)

- Refresher on callbacks, subtour elimination, separation,...
- Build the initial master problem
- Develop the code for separating violated inequalities.
- Embed the separation code in cut callbacks.
- Test the code on few benchmarks instances.

(lunch break)

2.00pm-4.00pm

Parallel branch-and-cut and efficient callbacks

- Common issues for parallelization and performance of callbacks.
- Make the cut callback work in parallel (lab).
- Make the cut callback efficient (lab).
- Add a heuristic through the heuristic callback API (lab).

(break)

4.15pm-6.00pm

Tuning and understanding CPLEX log

Wrapping up

Backup topic

- Benders (1 hour)