Using DecisionBrain Optimization Server with Open-Source Libraries - Master 2 Optimization Research Internship -

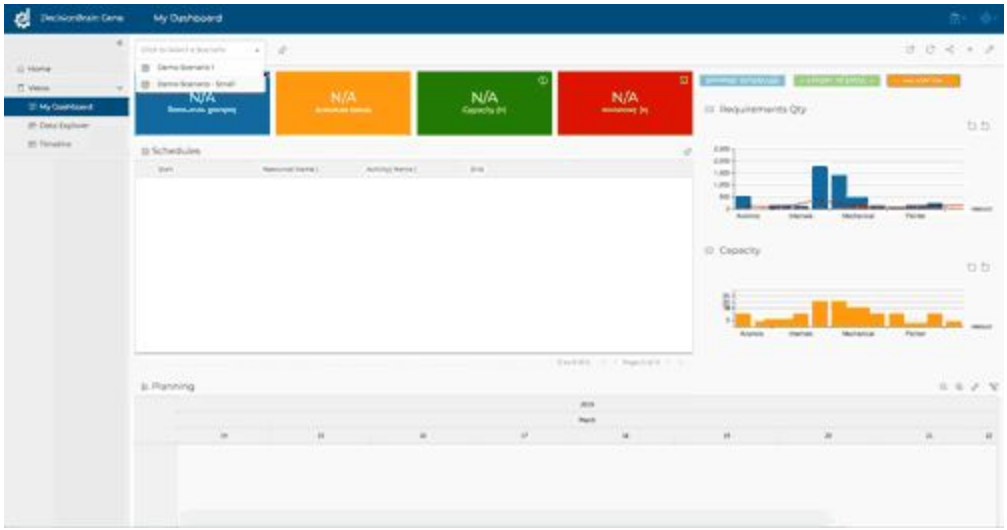
Context

DecisionBrain is a high-tech company that combines Optimization, Machine Learning and Artificial Intelligence to create innovative decision-support solutions that drive operational productivity and efficiency.

The internship will take place in our offices in Paris (10e) or Montpellier (Millénaire).

Decision Optimization Center

Decisionbrain develops a platform to create, deploy and maintain fully scalable decision support solutions. Quickly, easily, efficiently. DOC accelerates the creation and deployment of decision support solutions.It is written in Java for the back-end and in Angular for the the front-end, and relies on a number of technologies such as Spring, Docker, etc.



Subject

One of the components of the DOC platform is the Optimization Server that allows to run multiple CPU intensive computational jobs locally or remotely and provides administrative tools to easily monitor and manage them. DOC OS can run any intensive computational jobs written in Java, Python. It also includes Cplex Optimizer for both Mixed Integer Programming (MIP) and Constraint Programming (CP).

To illustrate the versatility of DOC OS the objective of the internship is to implement new examples of workers that will allow to run optimization models based on open-source libraries.

As the number of open-source libraries is large, the first part of the internship will be do a survey and a comparative study of the different open-source solvers including:

- Linear Programming and Mixed Integer Programming (Coin-OR, SCIP, …)
- Constraint Programming (Choco,..).
- Local Search (Google or-tools…)
- Heuristic and Metaheuristic (Oscar, Optaplanner,...)

The comparative study will include a benchmarking study on academic or industrial instances.

The second part of the internship will be to implement one or two new DOC OS *workers* that will illustrate how to run intensive computational jobs using an open-source solver studied in the survey and applied to a problem derived from an industrial context.

Skills Required
The candidate should have the following skills:

- Good knowledge in Operation Research
- Curiosity and ability to discover new frameworks and languages
- Good programming skills, preferably in Java.
- Version control systems, preferably Git.
- Build tools such as Gradle or Maven is a plus.
- Good English proficiency

Beyond technical skills, the candidate is expected to have some degree of autonomy and able to collaborate efficiently with other team members.

Possibility to apply to a PhD thesis position in Operation Research at DecisionBrain after the internship

Submission

The candidate can submit her/his application by sending to careers@decisionbrain.com the following information:

- A curriculum vitae
- An introductory letter
- The master 1 and master 2 records & transcripts