

PhD position at the University of Clermont-Ferrand (France).

Research topic: **Scheduling and routing of tasks in the context of healthcare system management**

PhD advisors: Philippe Lacomme, Thierry Garaix and Christophe Duhamel

Contact: Philippe Lacomme <placomme@isima.fr>

Garaix Thierry <garaix@emse.fr>

Christophe Duhamel <christophe.duhamel@isima.fr>

Salary : about 34 000 € per year

Localisation: LIMOS UMR CNRS 6158

(Université Clermont-Ferrand and jointly Mines Saint Etienne)

Starting dates: as soon as possible and before September 2019

Duration: 3 years position at the University of Clermont-Ferrand jointly at the EMSE (Ecole des Mines de Saint-Etienne). **Funding received from the National Research Agency (ANR).**

Context :

Research teams of EMSE Saint-Etienne (Ecole des Mines de Saint-Etienne) and of the University of Clermont-Ferrand received funding from the ANR for a research program relative to scheduling and routing integrated problems. Routing and scheduling problems are very common especially in healthcare system management and services at home which will provide our test bed cases:

- Medical staff management;
- Resource management including scheduling of operating rooms and ambulances for example;
- Management of transport for patient or customer from their current position to hospital, or for nurse-to-patient transport;

The problems to solve are of considerable interest for a practical point of view and require efficient methods to address large scale instances. Real life data could be provided by a service at home partner.

The challenging problem come from both the different objectives of patients/health-care staff and the coordination/synchronization between the schedules of different resources. In addition, some freelance workers have to be managed in a fair and profitable way.

Scientific objectives:

Mono-period problems with deterministic demands and resource availabilities will focus the first research step:

1. The first work will be the design of metaheuristic dedicated to planning and coordination of routing staff and patient care schedules;
2. The second step could be to ensure economic equity as regards of external staff;
3. The next step could be directed to multi-period problems where the long term quality of services could be optimized for staff, patients and the service provider company.

Required skills:

- Motivated candidates should hold a Master in optimization or a diploma from a high school in computer science
- Solid background in algorithmic
- Good programming skills with C/C++