

**Thesis subject: Robust Optimization des of wireless optical networks
with variable capacities**

PhD Advisors:

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Context of the thesis:

The thesis is part of the project activities of the Laboratory of Excellence (LABEX) at the Université de Technologie de Compiègne (UTC) in France on the Control of Technological Systems of Systems (MS2T) (www.labexms2t.fr). It is more specifically part of the Research topic 3: Optimized design of technological SoSs.

PhD thesis description:

This PhD thesis is on survivable wireless fiber optical networks and is essentially devoted to wireless fiber networks, like FSO (Free Space Optics), that are subject to frequent failures involving partial loss of links capacity. This work is in continuation of works on Flow Thinning a protection strategy proposed to deal with partial failures. The following points will be investigated during the thesis:

Collecting data on weather conditions and representing them as partial failures scenarios to be dealt with. This will produce a realistic representation of the problem but most likely involving a large number of multiple link partial failures (as the weather scenarios is huge). We will model the problem as a chance constrained programming problem, known to be computationally intractable in practice. As an important part of the PhD work, we plan to study the practical aspects of applying the Flow Thinning algorithm on FSO networks, especially from protocol point of view. Finally, there is also a theoretical issue that we plan to investigate during this PhD Thesis. When studying the Flow Thinning model, we have discovered that the LP formulation contains an exponential number of rows and columns, which is unusual in multi-commodity flows. We have solved this issue for the particular case, but it is of high interest to study it in a general LP formulation and identify conditions leading to tractable cases.

Candidate's profile:

Knowledge in Operations research, especially in Linear Programming, knowledge in networks are also necessary.

Documents required to apply:

Send to dritan.nace@hds.utc.fr

- Curriculum vitae
- Motivation letter
- At least two references and/or recommendation letters
- A statement of research experience and interests

Location:

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