Job description

Researcher CR2[1] (Chargé(e) de recherche de 2$^{\text{ème}}$ classe du développement durable)

The French institute of science and technology for transport, development and networks
(IFSTTAR)

Job title:	Researcher in "Planning and management of railway capacity"
Institution:	**IFSTTAR**, http://www.ifsttar.fr/
Discipline(s):	Computer science, operations research, artificial intelligence
Research structure:	**Components and systems department – ESTAS laboratory**
Location:	Ifsttar – site of Villeneuve d'Ascq (59)
Contact(s):	Joaquin Rodriguez, ESTAS Laboratory Director,
	email: joaquin.rodriguez@ifsttar.fr, Tel : (+33/0) 3 20 83 32
Salary scale	€2500 to €4200 per month gross

Job content

The researcher is expected to perform publication, supervision and research management activities. In particular, the researcher must aim at publishing his/her works on peer reviewed international journals according to the standard of his/her discipline, but also on journal or books more specifically in the applied areas of interest of Ifsttar. The researcher will contribute to major project proposals and management. He/She will also participate to the scientific and community life of the laboratory, the department and the institute.

More in detail, the aim of the job is the enhancing of the research on the management of the railway infrastructure (topic within the priorities of the COSYS department). The work will focus on different types of optimization problems which the railway worlds must face, as the management of urban areas and of large stations, the mixed passengers and freight traffic, and the interaction with other modes of transport.

The research topic to develop can be centered on different subjects, namely:

- The construction of service plans and timetables to best cover different types of demand, being compatible with other modes and considering different scales of a network (local, national and international).

- The problem of managing railway capacity for train paths to cover short term individual demands and long term structured and recurrent demands.

- The mastery of the phenomena of delay propagation and amplification to obtain a better compromise between the increase of buffer times in the timetable, the utilization of the available resources and the robustness of the traffic management problems.

- The problem of the resilience of the railway service in case of large perturbations due to natural catastrophes, attacks, major incidents, … .

The researcher will strengthen the "traffic management" team within the ESTAS laboratory and will interact with the other laboratories working on other transport modes within the de-

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[1] For a description of the CR2 position (permanent) see, for example,

   https://en.wikipedia.org/wiki/Academic_ranks_in_France

partment (LICIT, GRETTIA, …). He/She will be encouraged to take part to expert appraisal works and to both national (IRT Railenium, competitiveness cluster I-Trans, ANR…) and international (H2020) projects.

In addition to his/her research activity, the researcher will be expected to develop diversified activities in all or part of the following contexts:

- Teaching and research supervision (teaching, supervision of stages, PhD's and post-doctoral researchers, participation to juries and to teaching-related actions or committees).
- Administration and research animation activities (laboratory or team direction, project coordination, human resource management, experimental platform management).
- Promotion and communication activities (research and industrial contracts, expert appraisal works and consultancy, communication of the research findings toward the socio-economic world, contribution to the design of public policies, spread of the scientific culture).
- International activities (participation to European projects, international collaborations, contribution to the international visibility of the institute).
- Science outreach activities (member of learned societies, of editorial boards, of scientific committees of the institutes, of workshops, of experts commissions).

Expected profile

The candidate must either have obtained a PhD in computer science, operations research or artificial intelligence, or prove an equivalent education level, in particular for foreign candidates (publications, project participation, teaching).

A specialization or experience on one of the following topics will be appreciated: traffic and transportation management, multi-objective combinatorial optimization, decision support, iterative approaches for solving large scale problem instances, hybrid models (exact and heuristic methods, OR, AI), simulation.

There is no restriction on nationality but at least a basic level in French is needed. The application includes forms in French.

The candidate is expected to propose a research project in French for the job in his/her application. To do so, he/she is urged to get in touch with the referenced contact person.