Internship at l'INRIA - 2010 / 2011

Uncertainty and Sensitivity analysis for a land use / transport model

The proposed position takes place in the STEEP team. STEEP (Sustainability, Transition, Environment, Economy and local Policy) [http://steep.inrialpes.fr] is an interdisciplinary research lab of INRIA Rhône-Alpes [www.inrialpes.fr], whose aim is twofold:
1 - to identify and assess the relevant factors for a transition to sustainability at a local scale.
2 - to develop mathematical and computational decision-making tools to support decision makers in the implementation of this transition.

To do so, we make use and implement various energy / environment / land-use / transport models. These models are design to simulate the effects of a given policy, or to optimize a policy choice under constraints.

In particular, we are interested in TRANUS, which is an integrated land use and transport modeling package. Tranus simulates the location of activities in space, land use, the real estate market and the transportation system. It may be applied to urban or regional scales. It is specially designed for the simulation of the probable effects of projects and policies of different kinds in cities and regions, and to evaluate the effects from economic, financial and environmental points of view.

In this context, the aim of this internship is to develop an uncertainty and sensitivity analysis for the TRANUS model applied in Swindon (city in UK) [http://www.modelistica.com/swindoneng.htm]. The goal is to better understand the effect of the parameters uncertainties on the result of the simulation process. Various stochastic methods will be considered, like Monte Carlo approaches, variance-based approach and screening-design method.

People and cooperations

The project will be carried out in the STEEP lab at INRIA Rhône-Alpes, under the supervision of Dr. Emmanuel Prados (INRIA) and Dr. Elise Arnaud (LJK, UJF).

This position is offered at the “Rhone-Alpes” Research Unit of INRIA, located near Grenoble and Lyon (France). The unit includes more than 700 people, within 34 research teams and 10 support services.

Salary: approximatively 400 euros per months
Profile and conditions for applicants:

We are seeking qualified and motivated applicants with strong skills in applied mathematics and computer science. Strong knowledge in probability is desirable, in particular in stochastic programming. Knowledge of programming languages will be appreciated.

Duration: 6 months

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