

Post-Doc Position: Modeling and Control strategies for efficient water distribution network management

Summary

Water distribution networks (WDN) are an essential component of nowadays urban patrimony. In the current context of aging infrastructures and cost optimization, their efficient management has become a priority in order to deliver a quality drinking water to the population and proposes a real challenge in order to minimize water losses and the associated costs as well as insuring an efficient management.

In this context, the applicant will dispose of a real instrumented semi-rural WDN (over 10 communes) along with long series of measured data and his task in this project will be divided into two principal work packages:

- 1 The data-based modeling of the WDN: In this work package, it is intended to use system identification techniques in order to complement the traditional mechanistic models available.
- 2 The development of a decision tool based on the available models in order to:
 - Detect at an early stage system malfunctioning (leaks, sensor failures,...).
 - Propose control strategies in order to insure robustness against these malfunctioning.
 - Help WDN managers in their decision regarding water quality distribution throughout the network (future investment, control strategies for pumping and chlorination,...).

Expected Qualifications, Skills and Experience

- The applicant must be a ph. D. in Control, electrical engineering, computer science, applied mathematics or related fields.
- He must be competent in at least one of these fields: system identification, fault detection or control theory.
- Skills in PDE's, Graph theory or water processes are an advantage.
- Strong self motivation, autonomy and teamwork spirit is compulsory.

Conditions

- The project is granted by French FUI projects
- Expected to start : **between June and September 2017**
- Duration: 2,5 years
- Location : Nancy, France
- Centre de recherche en Automatique de Nancy (CRAN),UMR7039, Université de Lorraine
- Income: 2200 euros Netto/month
- Send your application to: samir.aberkane@univ-lorraine.fr, vincent.laurain@univ-lorraine.fr