Bayesian merging of local and global hydrologica

Record number : OPR-1215

Overview

RESEARCH DIRECTION

Marie-Amélie Boucher, Professeure - Department of Civil and Building Engineering

INFORMATION

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ADMINISTRATIVE UNIT(S)

Faculté de génie
Département de génie civil et de génie du bâtiment

LEVEL(S)

3e cycle

LOCATION(S)

Campus de Sherbrooke

Project Description

This project is under the new Canada Research Chair in Hydrological Ensemble Forecasting and is a follow up on a previous study. During this previous study, we started working on merging local and global hydrological forecasts using simple techniques. The goal of this new project is to develop more robust forecast merging methods based on Bayes theorem. Global hydrological forecasts are produced by large-scale models, with a wide spatial coverage that encompass one or more countries, or even the entire world. These large-scale forecasting systems have recently gained popularity, particularly with the advent of Google in the field of hydrological forecasting. Forecasts from those systems can be extremely useful, particularly for locations where local expertise or resources are not available to set-up a local forecasting system. However, the coexistence of these large-scale systems with well-established and efficient local hydrological forecasting systems raises questions and concerns. This is potentially the case, for example, in Quebec, where the government has developed a strong expertise in hydrological forecasting over time. This series of projects is based on the central hypothesis that it is advantageous to combine forecasts from different systems (local and global) in order to take advantage of their respective strengths. In a previous project, simple combination methods have been successfully tested. This second phase, which is the subject of the proposed doctoral project, consists of testing a more sophisticated fusion method, based on Bayes' theorem. This experiment will take place across Canada, and potentially beyond.

The ideal candidate for this project must be proficient in programming (Python), in hydrology, teamwork, have good communication skills, be resourceful, respectful and creative. A master's degree in hydrological and/or meteorological modeling is essential. Knowledge of French is a major asset.

The project could begin in September 2025 or later (e.g. January 2026).

To apply, send your CV, academic transcripts and motivation letter to marie-amelie.boucher@usherbrooke.ca

Discipline(s) by sector

Sciences naturelles et génie

Funding offered

Yes

$ 30 000 + performance bonuses

The last update was on 23 April 2025. The University reserves the right to modify its projects without notice.