



October 31, 2022

Postdoctoral Position in Machine Learning-based Seasonal Runoff Forecasting

The University of Saskatchewan invites applications for a postdoctoral position in the Department of Civil, Geological, and Environmental Engineering. We seek a highly qualified and motivated individual with research experience in machine learning (ML) and hydrologic modeling, solid understanding of data science and data mining, and familiarity with conventional and emerging river flow forecasting tools. Strong programming skills, along with organization and communication skills, are necessary for this position. Knowledge in cold regions hydrology in general, and the Canadian prairies in particular, will be needed for the candidate to conduct the required research. The position is funded by the Oceans Program of the National Research Council Canada (NRC) for a period of **three years**. **The start date is as soon as possible once the candidate is selected.**

The successful candidate will work as part of a team of researchers and graduate students led by **Professor Amin Elshorbagy** within the Centre for Advanced Numerical Simulation (CANSIM). The candidate will work closely with NRC research engineers from the Ocean, Coastal and River Engineering Research Centre and will communicate frequently with staff from Saskatchewan Water Security Agency, Manitoba Infrastructure, Alberta Flood Forecasting Centre, and other stakeholders from the industry. The goal of this project is to develop generic ML-based models for season-ahead forecasting of spring runoff volumes/amounts in the Canadian prairie provinces of Alberta, Saskatchewan, and Manitoba to help provincial governments and other stakeholders in season-ahead planning and management of available water resources. This will also allow for forecasting freshwater fluxes into Hudson Bay, thus identifying a direct connection from headwaters to the sea.

Apparently, the project requires a candidate who has strong knowledge in prairie hydrology, computer programming (e.g., Python, R), GIS, ML techniques, such as different types of neural networks, including deep learning architectures, random forest, genetic programming, clustering, applied statistics, meteorology, and climate science. Experience with Linux, GPUs, cloud services, TensorFlow, PyTorch, and other similar alternatives would be very useful. Excellence in research as demonstrated through publications in international journals of high standing is desirable. The successful candidate will be paid **\$50,000-\$55,000** per year, depending on expertise and skills. In addition to fulfilling the project requirements and leading scientific publications, the postdoctoral fellow will also assist Professor Elshorbagy in guiding CANSIM graduate students, while enjoying collaboration with other research centres and initiatives of the University of Saskatchewan.

Applications should include a letter of interest, academic transcripts, and a full CV. Applications should be sent by **email** to Professor Amin Elshorbagy (amin.elshorbagy@usask.ca). Interviews will be scheduled very soon after receiving the applications. For more information about CANSIM and research initiatives, please visit: <http://www.hydropyramids.com>.