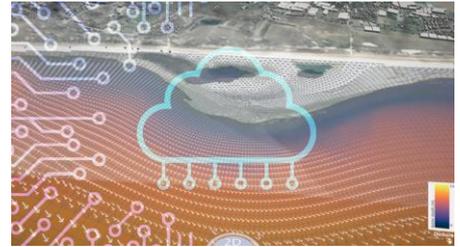


Research towards the cloud-readiness of the Delft3DM FM suite

This graduation internship is best suited for a Master related to hydrology or hydraulics.



HKV is a consultancy firm which provides state-of-the-art services in the areas of flood risk and water management. We translate cutting-edge technologies and knowledge to practical applications using high analytical and technical skills.

We offer a graduation internship position at HKV in the Product & Services group in close collaboration with the Deltares Software Centre, giving the student the opportunity to experience what working for a water & software-oriented consultancy is like. We are located in Delft at the Delfttechpark and in Lelystad.

Prior knowledge/experience on cloud computing or simulation software is preferred, but not mandatory.

Motivation

The Netherlands are shaped by the ocean, wind, waves and currents shape our delta. Climate change and rising sea levels add further to this pressure. To understand these processes, simulation software simulates the effect of storm surges, hurricanes, tsunamis, detailed flows and water levels and waves on our country. The software used for water and climate simulations are computationally demanding. Cloud computing offers the opportunity for more detailed or faster simulations.

The Delft3D FM Suite¹ is an example of such simulation software. The engines of this suite can run large computations in parallel on distributed memory.

The era of cloud computing has just begun and we have not yet fully exploited its potential. Cloud computing offers horizontal scalability and elasticity. Problems could be solved more in parallel. Cloud platforms offer many configuration options, which leaves users of the Delft3D FM suite with choices that are not always easy to make.

Research Questions

In this graduation internship:

- You will do a literature review on the computational processes in the simulation engine of the Delft3D FM suite in combination with the powers of the cloud.
- You will analyze the cloud configurations of commercial cloud instances to simulate models using the Delft3D FM suite.
- You will simulate both a big, complex model and a small, fine meshed model in parallel and derive statistics on the performance.
- The current common approach at water authorities is to have multiple simulation models chained together, which are partially run in parallel and partially in series. You will investigate and reflect if this conventional approach is still necessary using cloud instances or can this Pandora's box open new approaches to optimize this process in the cloud?



Internet: www.hkv.nl

Contact:

Mattijn van Hoek

Email: hoek@hkv.nl

Telefoon: 06-35119762

¹ { HYPERLINK : "<https://www.deltares.nl/en/software/delft3d-flexible-mesh-suite/>" }