

**Jobbnorge-ID:** 194069  
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**Nettside:** <http://www.ntnu.no>  
**Omfang:** Heltid  
**Varighet:** Vikariat/Midlertidig

The Department of ocean operations and civil engineering has a vacancy for a

## PhD Candidate within water and environmental engineering for smart cities

### This is NTNU

At NTNU, creating knowledge for a better world is the vision that unites our 7 400 employees and 42 000 students.

We are looking for dedicated employees to join us.

You will find more information about working at NTNU and the application process [here](#).

Video: <https://www.youtube.com/watch?v=cJgKd1SwGLI>

### About the position

We have a vacancy for a PhD position related to this topic:

#### Optimization of drinking water treatment plants through digital twins

Today's operation and maintenance of water treatment plants is mostly driven by human experience and criteria which determines the efficiency of the process. Plant operators are also facing major challenges associated with responses to process disturbances (e.g. variations in raw water quality, filtration inefficiencies etc.). Overcoming challenges associated with human in the loop in plant operations is very critical to ensure optimal and cost-effective operations of water treatment plants. Advances in sensors and actuator technologies with data transmission and cloud

connectivity for the water sector, as well as developments in software engineering for digitalization and artificial intelligence, provide an unprecedented opportunity for large-scale implementation of digital twins. Digital twins for process operations are particularly attractive to implement since they can objectively maximize the performance of treatment processes through process modelling and simulation, as well as overcoming human in the loop limitations. Although the implementation of digital twins in the water sector is at its infancy, it is already starting to bring great attention as an innovation driver for the sector within the broader context of smart cities development.

The water group at Department of Ocean Operations and Civil Engineering (IHB) is pioneering in the digitalization of the water sector. In connection with this, the group is currently undertaking a project (SmartVann) to digitalize the water infrastructure in the city of Ålesund. The PhD research will be carried out in an interdisciplinary environment. The Water Group at IHB have ongoing PhD projects working on related aspect of challenges facing the water sector within the broader context of smart city development in close collaboration with the Ålesund Municipality. In line with the strategy of IHB, the candidate will be expected to collaborate with researchers across many of the research groups in the Department. The student will also work in close collaboration with staff from the Water and Wastewater Department of Ålesund Municipality.

The position is located in Ålesund and reports to the head of the department.

### Duties of the position

The main goal of this PhD work is to develop a digital twin for the optimization of a drinking water treatment plant operations by accounting for the drinking water source and key treatment processes.

The PhD work will focus on the following areas:

- modelling and simulation of key water treatment processes;
- development of an interactive digital twin for the key water treatment processes
- integration of process models with real-time data through IoT and BigData
- development of a visualization and user-friendly platform for operation and maintenance of key treatment processes.

## Required selection criteria

PhD candidate:

The PhD-position's main objective is to qualify for work in research positions. The qualification requirement is that you have completed a master's degree or second degree (equivalent to 120 credits) with a strong academic background in Computer science, Data science or Water and environmental engineering or equivalent education with a grade of B or better in terms of [NTNU's grading scale](#). If you do not have letter grades from previous studies, you must have an equally good academic foundation. If you are unable to meet these criteria you may be considered only if you can document that you are particularly suitable for education leading to a PhD degree.

The appointment is to be made in accordance with the regulations in force concerning [State Employees and Civil Servants and national guidelines for appointment as PhD, post doctor and research assistant](#).

- Strong programming and software development skills
- Have knowledge in process control & optimization theory and applications

## Preferred selection criteria

- Have knowledge and interests in industry 4.0 and technologies for visualization
- Good written and oral English language skills (must be documented)

## Personal characteristics

- Good communication skills
- Ability to work independently as well as in team
- Ability to make research at an international level
- Keen interest in the wider context of own research, and an ability to engage in cross-disciplinary teams

In the evaluation of which candidate is best qualified, emphasis will be placed on education, experience and personal suitability, as well as motivation, in terms of the qualification requirements specified in the advertisement

## We offer

- exciting and stimulating tasks in a strong international academic environment
- an open and [inclusive work environment](#) with dedicated colleagues
- favourable terms in the [Norwegian Public Service Pension Fund](#)
- [employee benefits](#)

## Salary and conditions

PhD candidate:

PhD candidates are remunerated in code 1017, and are normally remunerated at gross from NOK 479 600 per annum before tax, depending on qualifications and seniority. From the salary, 2% is deducted as a contribution to the Norwegian Public Service Pension Fund.

The period of employment is either 4 years with required duties, or 3 years without required duties.

Appointment to a PhD position requires that you are admitted to the PhD programme in engineering (<https://www.ntnu.edu/studies/phiv>) within three months of employment, and that you participate in an organized PhD programme during the employment period.

The engagement is to be made in accordance with the regulations in force concerning State Employees and Civil Servants, and the acts relating to Control of the Export of Strategic Goods, Services and Technology. Candidates who by assessment of the application and attachment are seen to conflict with the criteria in the latter law will be prohibited from recruitment to NTNU. After the appointment you must assume that there may be changes in the area of work.

It is a prerequisite you can be present at and accessible to the institution daily.

## About the application

The application and supporting documentation to be used as the basis for the assessment must be in English.

Publications and other scientific work must follow the application. Please note that applications are only evaluated based on the information available on the application deadline. You should ensure that your application shows clearly how your skills and experience meet the criteria which are set out above.

The application must include:

- CV, certificates and diplomas
- Research plan or project proposal (one page)
- A list of academic works - published or unpublished - that you would like to be considered in the assessment
- Name and address of three referees

Joint works will be considered. If it is difficult to identify your contribution to joint works, you must attach a brief description of your participation.

In the evaluation of which candidate is best qualified, emphasis will be placed on education, experience and personal suitability.

NTNU is committed to following evaluation criteria for research quality according to [The San Francisco Declaration on Research Assessment - DORA](#).

## General information

[Working at NTNU](#)

A good work environment is characterized by diversity. We encourage qualified candidates to apply, regardless of their gender, functional capacity or cultural background.

**The city of Ålesund**, with its population of 50 000, will provide you with plenty of opportunities to explore a region of Norway that is famous for its beautiful scenery with high mountains and blue fjords. Ålesund itself, with its Art Nouveau architecture, is by many considered to be the most beautiful city in Norway! The Norwegian welfare state, including healthcare, schools, kindergartens and overall equality, is probably the best of its kind in the world.

As an employee at NTNU, you must at all times adhere to the changes that the development in the subject entails and the organizational changes that are adopted.

Information Act (Offentleglova), your name, age, position and municipality may be made public even if you have requested not to have your name entered on the list of applicants.

If you have any questions about the position, please contact professor Carlos Salas Bringas, e-mail [casabrin@ntnu.no](mailto:casabrin@ntnu.no) or professor Razak Seidu, e-mail [rased@ntnu.no](mailto:rased@ntnu.no). If you have any questions about the recruitment process, please contact Siri Schulerud, e-mail [ssc@ntnu.no](mailto:ssc@ntnu.no).

Please submit your application electronically via [jobbnorge.no](http://jobbnorge.no) with your CV, diplomas and certificates. Applications submitted elsewhere will not be considered. Diploma Supplement is required to attach for European Master Diplomas outside Norway. Chinese applicants are required to provide confirmation of Master Diploma from [China Credentials Verification \(CHSI\)](#).

If you are invited for interview you must include certified copies of transcripts and reference letters. Please refer to the application number SO-IV 209/20 when applying.

**Application deadline: 26.10.2020**

## NTNU - knowledge for a better world

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The Norwegian University of Science and Technology (NTNU) creates knowledge for a better world and solutions that can change everyday life.

### Department of Ocean Operations and Civil Engineering

We aim to be a hub of international knowledge and innovation in maritime operations, coastal and urban infrastructure. This involves education and research on water infrastructure with specific focus on water treatment plants operation, water quality modelling and simulation as well as digitalization of water infrastructure. Water engineering operations integrate technology, human factors and business. The interfaces between these areas often spark inspiration for innovation and new solutions. The Department of Ocean Operations and Civil Engineering is one of eight departments in the Faculty of Engineering.

## Tilleggsinformasjon

### Arbeidssted:

NTNU Ålesund 6025 Ålesund (Ålesund Kommune)