

*The University of Agder has more than 1200 employees and 12000 students. This makes us one of the largest workplaces in Southern Norway. Our staff research, teach and disseminate knowledge from a variety of academic fields. Co-creation of knowledge is our common vision. We offer a broad range of study programmes in many fields. We are situated at two modern campuses in Kristiansand and Grimstad respectively.*

*We are an open and inclusive university marked by a culture of cooperation. The aim of the university is to further develop education and research at a high international level.*

## **PhD Research Fellow in Renewable Energy within Analysis and Control of Adjustable Speed Pump-turbine units**

The University of Agder invites applications for a PhD fellowship in Renewable Energy within Analysis and Control of Adjustable Speed Pump-turbine Units for a period of 3 years. The position is linked to The Department of Engineering Sciences. The starting date is 15 September 2017 or as negotiated with the faculty.

[The Department of Engineering Sciences](#) has more than 90 employees in scientific positions, and more than 1500 students at all levels. A variety of research is conducted within all the groups; Mechatronics, Renewable Energy, Civil Engineering and Industrial Economy, and we also welcome interdisciplinary projects within the department or with other research groups. This position will be associated with the Renewable Energy group. We have a broad international cooperation, and close collaboration with industrial partners and public services in the region. This is a benefit both for teaching and research. The partners contribute with assignments, competence and resources.

### **Research work and context**

In recent years, there has been increasing interest in the development of hydropower pump storage systems, since they allow an efficient integration of other intermittent renewable energy sources (for example wind, PV, and others). The main challenge to integrate those renewable energy sources to the grid is the stability of the electrical power network. Variable-speed pump-turbine units have been an interesting solution to increasing the stability of power systems, due to their advantages on control of active and reactive power in pumping and generating mode. Advanced control methods for the pump-turbine units are very important to stabilise the power systems, to maximise energy production, and minimise energy consumption in pumping mode.

The PhD research project will focus on the modelling and analysis of the dynamic behavior of adjustable-speed pump-turbine units, which include hydraulic and electrical components. Advanced vector control methods for motor-based hydropower pump-turbine units will be developed. The main objective is to effectively control the generation of active and reactive power, and to reduce pumping system energy consumption through control algorithms and operating practices. The project tasks include, but are not limited to, developing and modelling control strategies for real time operation. The control algorithm will be validated via hardware-in-the-loop (HIL) and scaled experimental setup. The validated model will also be used for the simulation of a real case-study. Therefore, it is expected that the candidate undertakes significant practical work and experimentation in the electrical power laboratory at UiA. Collaboration with regional industrial partners is also envisaged for collecting the data for the real case-study simulation.

### **Admission requirements**

The candidate will be enrolled in the PhD programme in Renewable Energy at the Faculty of Engineering and Science. The applicant must qualify for admission to this PhD Programme. More information about the programme and a complete list of admission requirements for the PhD programme can be found [here](#).

Proficiency in oral and written English is required. Knowledge of Norwegian or another Scandinavian language is an advantage.

Regarding English skills, please check [here](#) to see if an English test is required.

Further provisions relating to the position as PhD Research Fellow can be found in the [Regulations Concerning Terms and Conditions of Employment for the Posts of Post-Doctoral Research Fellow, Research Fellow, Research Assistant and Resident](#).

### **Additional requirements**

The successful applicant should hold a master's degree from a Norwegian or an accredited foreign university in renewable energy, mechatronics, electrical engineering, mechanical engineering or a similar/related field and competence in areas relevant to the position.

The following additional requirements should be met:

- Programming skills in Matlab, C++, LabView.
- Strong academic skills or interest in the following areas: motor control, power electronics, smart grid, and power systems.
- Experiences on HIL, microcontroller or DSP control boards are advantageous.

The applicant must submit an approved project description within three months of appointment. The PhD dissertation must be written in English.

The position places great demands on the applicant's capacity for independent goal-oriented work, their ability to concentrate, and on attention to detail. Applicants will be assessed on the basis of academic background and results, and any previous research and development work. Relevant industrial experience, personal suitability and good teamwork skills will also be emphasised.

Research visits to an external institution or with a national or international partner for part of the period of employment may be anticipated, as indicated in the above text.

Short-listed applicants will be invited for interviews. With the applicant's permission, UiA will also conduct a reference check before appointment.

### Remuneration

The position is remunerated according to the State Salary Scale, code 1017 Research Fellow, salary NOK 435 500 gross per year. A 2 % compulsory pension contribution to the Norwegian Public Service Pension Fund is deducted from the pay according to current statutory provisions.

The Norwegian Public Service is committed to reflecting the diversity of society, and the personnel policy of the University of Agder aims to achieve a balanced workforce. All qualified persons are therefore encouraged to apply for the position, irrespective of cultural background, gender, age, or disability.

Appointment is made by the University of Agder's Appointments Committee for Teaching and Research Positions. The successful applicant will have rights and obligations in accordance with the current regulations for the Public Service.

### Application

Submit your application and CV online. Please click on the link "**Apply for this job**". The following documentation should be submitted as attachments to the online application:

- A letter of application which includes a rationale for applying for the position together with an outline of the applicant's research interests and background for the proposed project
- Certificates and/or grades for all post-secondary education, up to and including bachelor's level; master's degree/higher degree certificate
- Applicants with foreign higher education must attach an official description of the grading system used at the issuing institution
- An additional assessment of English may be undertaken at the time of interview
- Summary and links to the applicant's scientific publications if produced

Original documents must be presented for verification to the University of Agder. Successful candidates will be asked, normally during the interview, to ensure that the issuing university submits documents in a sealed envelope directly to UiA or provide access to their documents online, which allows UiA to verify the authenticity of these electronic documents via a secure website hosted at the issuing university (contact person at UiA will be provided later for certain candidates).

The applicant is fully responsible for submitting complete documentation. Without complete documentation we cannot, unfortunately, include you in the assessment process.

All documentation of education must be in the original language and in English, Norwegian, Swedish, or Danish (if the original language is not one of these). The application should include a translation, which should preferably be from the issuing university. Additional documentation must be in English, Norwegian, Swedish or Danish.

### Closing date: 30.06.2017

For further information please contact Associate Professor Khang Huynh, tel. +47 37 23 34 21, e-mail [huyh.khang@uia.no](mailto:huyh.khang@uia.no) or Assistant Head of Department Tom Viggo Nilsen, tel. +47 37 23 32 55, e-mail [tom.v.nilsen@uia.no](mailto:tom.v.nilsen@uia.no).

In accordance with §25(2) of the Freedom of Information Act, applicants may request that they are not identified in the open list of applicants. The University, however, reserves the right to publish the name of applicants. Applicants will be advised of the University's intention to exercise this right.

Jobbnoerge ID: 137329, Deadline: Closed