Positions in the PIRC project (draft)

**About the project/positions:** Three PhD/researchers to be hired during the project period 2020-2025.

**Project summary:** PIRC targets a psychology-inspired computing breakthrough through research combining insight from cognitive psychology with computational intelligence to build models that forecast future events and respond dynamically. The systems will be aware and alert for how to best act given their knowledge about themselves and perception of their environment. Humans anticipate future events more effectively than computers. We combine sensing across multiple modalities with learned knowledge to predict outcomes and choose the best actions. Can we transfer these skills to intelligent systems in human-interactive scenarios? In PIRC, we will apply our machine learning and robotics expertise, and collaborate with researchers in cognitive psychology, to apply recent models of human prediction to perception-action loops of future intelligent robot companions. Our work will allow such robots to adapt and act more seamlessly with their environment than the current technology. We will equip the robots with these new skills and in addition, provide them with the knowledge that users they are interacting with, apply the same mechanisms. This will include mechanisms for adaptive response time from quick and intuitive to slower and well-reasoned. The models will be applied in two robotics applications with potential for very wide impact: physical rehabilitation and home care robot support for older people.

------- Det over er til info internt, og skal ikke inngå i utlysningen

**Researcher position in psychology-inspired computing**

A full-time researcher position (SKO1109) in psychology-inspired computing is available as a part of the research project Predictive and Intuitive Robot companion (PIRC). The project is affiliated with RITMO Centre for Interdisciplinary Studies in Rhythm, Time and Motion at the University of Oslo.

RITMO is a Centre of Excellence funded by the Research Council of Norway. This interdisciplinary centre focuses on rhythm as a structuring mechanism for the temporal dimensions of human life. Methods from musicology, psychology, neuroscience, and informatics are combined to study rhythm as a fundamental property that shapes and underpins human cognition, behavior and cultural expressions.

All RITMO researchers are co-located and work in a unique interdisciplinary constellation, with world-leading competence in musicology, psychology and informatics. It is expected that all members of the centre contribute to the general activities and collaborations within RITMO. The researchers have access to state-of-the-art facilities in sound/video recording,
motion capture, eye tracking, physiological measurements, various types of brain imaging (EEG, fMRI), and rapid prototyping and robotics laboratories.

Job description

The researcher will work on psychology-inspired computing related to robot assistants. That is, the objective of the position is to create prediction methods for proactive planning of future robot actions and to design robot acting mechanisms for adaptive response ranging from quick and intuitive to slower well-reasoned. We combine sensing across multiple modalities with learned knowledge to predict outcomes and choose the best actions. The goal is to transfer these skills to intelligent systems in human-robot interactive scenarios to be supporting people in their own homes. The candidate will also be contributing to revise a computational reference architecture to incorporate the studied psychological mechanisms.

The appointment is for a period of four years, starting 1 September 2021. The successful candidate is expected to become part of the research environment/network of RITMO and contribute to its development.

Qualifications:

- Applicants must have a PhD degree or other education equivalent to a Norwegian doctoral degree in computer science including machine learning/artificial intelligence and preferably also some robotics (other degrees would be considered if qualifications match).
- Applicants should have a strong background in programming, machine learning/artificial intelligence and preferably also robotics.
- Advantage: knowledge background in bio-inspired methods, psychology-inspired computing models, psychology/neuroscience.
- The applicant is required to document in the application letter in what way the past education and experience match the profile for the post. Thus, in the application letter, please briefly describe your motivation for the position and the relevance of the Master/PhD thesis work and other project work relevant for the position.
- Applicants for the position should have scientific publications relevant to this position, and both their quantity and quality (impact of the journal(s) and conference(s)) would be important selection criteria.
**PhD position: Robot Sensing and Control for Physical Rehabilitation at Home**

A Doctoral Research Fellowship (SKO 1017) in **robot sensing and control for physical rehabilitation at home** is available as a part of the research project **Predictive and Intuitive Robot companion (PIRC)**. The project is affiliated with **RITMO Centre for Interdisciplinary Studies in Rhythm, Time and Motion** at the University of Oslo.

RITMO is a Centre of Excellence funded by the Research Council of Norway. This interdisciplinary centre focuses on rhythm as a structuring mechanism for the temporal dimensions of human life. Methods from musicology, psychology, neuroscience, and informatics are combined to study rhythm as a fundamental property that shapes and underpins human cognition, behavior and cultural expressions.

All RITMO researchers are co-located and work in a unique interdisciplinary constellation, with world-leading competence in musicology, psychology and informatics. It is expected that all members of the centre contribute to the general activities and collaborations within RITMO. The researchers have access to state-of-the-art facilities in sound/video recording, motion capture, eye tracking, physiological measurements, various types of brain imaging (EEG, fMRI), and rapid prototyping and robotics laboratories.

**Job description**

The objective of this position is to apply the developed models for prediction and adaptive response for a robot supporting in rehabilitation in a home environment. Thus, there has to be undertaken implementation and research within robot perception and control relevant for rehabilitation training tasks. In addition, user studies through human robot interaction experiments are to be performed.

The appointment is for a period of three years, starting 15 August 2021. There might be a possibility to extend to 4 years depending on the qualifications of the recruited candidate, the department’s need for teaching and the centre’s need for lab assistants.

**Qualifications:**

- MSc degree in computer science, robotics, or other relevant field is required. The applicant is required to document that the degree corresponds to the profile for the post.
- Applicants should have a strong background in programming, robotics and preferably also in machine learning/artificial intelligence.
- Advantage: human-robot interaction, robot perception and control, user-centered design, motion tracking and analysis, physical rehabilitation training. Further, having scientific publications would be an advantage.
In the application letter, please briefly describe your motivation for the position and the relevance of the Master thesis work and other project work relevant for the position.

- Fluent oral and written communication skills in English
- Good collaborative skills

The Faculty of Mathematics and Natural Sciences has a strategic ambition of being a leading research faculty. Candidates for these fellowships will be selected in accordance with this, and expected to be in the upper segment of their class with respect to academic credentials.

The purpose of the fellowship is research training leading to the successful completion of a PhD degree. The fellowship requires admission to the PhD programme at the Faculty of Mathematics and Natural Sciences. The application to the PhD programme must be submitted to the department no later than two months after taking up the position. For more information see:

Doctoral degree and PhD at the University of Oslo

Doctoral degree: PhD in Mathematics and Natural Sciences

**PhD position: Home Care Robot Support**

A Doctoral Research Fellowship (SKO 1017) in **Home Care Robot Support** is available as a part of the research project **Predictive and Intuitive Robot companion (PIRC)**. The project is affiliated with **RITMO Centre for Interdisciplinary Studies in Rhythm, Time and Motion** at the University of Oslo.

RITMO is a Centre of Excellence funded by the Research Council of Norway. This interdisciplinary centre focuses on rhythm as a structuring mechanism for the temporal dimensions of human life. Methods from musicology, psychology, neuroscience, and informatics are combined to study rhythm as a fundamental property that shapes and underpins human cognition, behavior and cultural expressions.

All RITMO researchers are co-located and work in a unique interdisciplinary constellation, with world-leading competence in musicology, psychology and informatics. It is expected that all members of the centre contribute to the general activities and collaborations within RITMO. The researchers have access to state-of-the-art facilities in sound/video recording, motion capture, eye tracking, physiological measurements, various types of brain imaging (EEG, fMRI), and rapid prototyping and robotics laboratories.
**Job description**

The objective of this position is to apply the developed models for prediction and adaptive response for a robot contributing to home care. The research will be focused on two different tasks: preparing food in the kitchen and interacting with a human with regards to bringing food etc and returning remains. Thus, there has to be undertaken implementation and research within robot perception and control, as well as user studies, relevant for the home care tasks.

**Qualifications:**

- MSc degree in computer science, robotics, or other relevant field is required. The applicant is required to document that the degree corresponds to the profile for the post.
- Applicants should have a strong background in programming, robotics and preferably also in machine learning/artificial intelligence.
- Advantage: human-robot interaction, robot perception and control, user-centered design, motion tracking and analysis. Further, having scientific publications would be an advantage.
- In the application letter, please briefly describe your motivation for the position and the relevance of the Master thesis work and other project work relevant for the position.
- Fluent oral and written communication skills in English
- Good collaborative skills

The Faculty of Mathematics and Natural Sciences has a strategic ambition of being a leading research faculty. Candidates for these fellowships will be selected in accordance with this, and expected to be in the upper segment of their class with respect to academic credentials.

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[Doctoral degree and PhD at the University of Oslo](#)

[Doctoral degree: PhD in Mathematics and Natural Sciences](#)