Norway:PhD Research Fellowship in Machine Learning and Information Retrieval for Music-Related Movement

A PhD position is available within the Robotics and Intelligent Systems group (ROBIN) at the Department of Informatics, University of Oslo. The main area of focus within the position is automated classification of motion capture data of dance recordings, including feature extraction

and selection, and matching against semantic descriptions of the data.

The research in the Robotic and Intelligent systems group is on machine learning strategies for a wide range of applications, including robotics, health care and music. Four permanent faculty members constitute the group, along with ten PhD students, five postdoctoral research fellows, and a lab engineer. The recruited candidate will be working within the recently awarded Centre of Excellence, Centre for Interdisciplinary Studies in Rhythm, Time and Motion (RITMO), alongside leading researchers from the Department of Informatics, Department of Musicology and the

Department of Psychology at the University of Oslo.

The appointment is for a period of 3 years. There might be a possibility to extend to 4 years depending on the qualifications of the recruited candidate, and the department's need for teaching

and lab assistants.

Suggested starting date 1 April 2018.

Project description:

The field of Music Information Retrieval (MIR) has developed advanced strategies for analysing music as an auditory phenomenon. Strategies involve feature extraction and selection based on physical properties of the sound signal and also models of human perception. Another important aspect of music, which to a lesser degree has been subject to MIR research, is movement: Music

starts with sound-producing movement, and often also results in movement in the form of dance.

Movement may be quantified precisely using motion capture technology. But how are quantitative representations of movement related to semantic descriptions of the same movement? Can a computer be trained to classify dance styles and dance genres? And is it possible for a computer or

a robot to imitate human dance movement from audio?

In the announced project, the recruited PhD candidate will research machine learning techniques

for full-body motion capture data. The work involves contributing to data collection using state-of-the-art motion capture technology from Qualisys. Futher the candidate will use the

collected motion capture data as training data for various machine learning tasks:

Automated generic post-processing techniques for motion capture data

(automatic marker recognition, gap-filling and marker swapping)

Classification of dance data based on semantic descriptions

(such as dance genre/style, gender, expressivity, etc.)

Explore deep learning techniques for automated synthesis of dance movement.

Requirements and qualifications:

The Faculty of Mathematics and Natural Sciences has a strategic ambition of being a leading research faculty. Candidates for this fellowship will be selected in accordance with this, and

expected to be in the upper segment of their class with respect to academic credentials.

Applicants must have a Master’s degree in a relevant field such as computer science, machine learning, biokinematics or musicology/music information retrieval. A solid background in computer science and machine learning is required, as well as good analytical and programming skills. Experience with Matlab and MIRtoolbox/MoCap toolbox is preferable. Further, competence in several of the following fields is desired and will be considered an advantage when candidates are

ranked: data analysis, digital signal processing, motion capture technology and music.

Candidates without a Master’s degree have until 31.01.2018 to receive their degree.

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.

Tentative Submission Deadline : 31 October 2017

Further Information