

Sweden: Doctoral student in mathematics

During the last few years the field of computer vision has seen a large increase in performance in object detection and recognition tasks. This is due to the successful application of convolutional artificial neural networks (CNN). However, a severe remaining limitation is the inability to robustly handle natural environments and low light levels. In this cross-disciplinary project, the aim is to develop artificial architectures based on existing visual neural architectures in animals, and will be a collaboration between the Department of Biology at Lund University and the computer vision group at the Centre for Mathematical Sciences, Faculty of Engineering, Lund University. We offer a Ph.D.-position that will involve disciplinary and methodological research on the border between information science and biology. The goal will be to investigate relevant biological models and modify these so that they become mathematically and algorithmically tractable to solve the underlying engineering problems robustly and accurately, specifically looking at how CNNs can be used in applications related to visual navigation, localization and recognition at low light levels.

Eligibility

A person meets the general admission requirements for third-cycle courses and study programmes if he or she:

1. has been awarded a second-cycle qualification, or
2. has satisfied the requirements for courses comprising at least 240 credits of which at least 60 credits were awarded in the second cycle, or
3. has acquired substantially equivalent knowledge in some other way in Sweden or abroad.

A person meets the specific admission requirements if he or she has:

1. at least 90 credits of relevance to the subject area, of which at least 60 credits from the second cycle and a specialised project of at least 30 second-cycle credits in the field, or
2. a second-cycle degree in a relevant subject.

In practice this means that the student should have achieved a level of knowledge in mathematics that corresponds to that of Master of Science programmes in Engineering Mathematics or Engineering Physics or a Masters degree in mathematics or applied mathematics.

The student must also be judged to have the potential to go through the Ph.D. programme.

Basis of assessment

A good knowledge of mathematics and its technical application is required. We value candidates who have experience with mathematical modelling, biological modelling, computer vision, image analysis and machine learning.

The assessment of the application will be made on the following criteria:

1. Depth of knowledge and academic record in Mathematics and its applications within technology, along with a good ability to assimilate new knowledge within the subject and its applications.
2. Experience in mathematical modelling and biological modelling.
3. Experience and knowledge within computer vision, image analysis and machine learning.

The assessment will be based on provided documents, written application, and for a smaller select group of applicants, interviews.

Limit of tenure, four years according to HF 5 kap 75.

Tentative Submission Deadline : 1 March 2018

[Further Information](#)