Ansökan om medel för fakultetsgemensam forskarutbildningskurs 2019
Application for funding of faculty common course 2019

Kursnamn: Deep Learning
Name of course

Omfattning (högskolepoäng): 5+3 (the extra 3 credits are obtained via a voluntary course project)
ECTS credits

Tidsperiod: March – June, 2019
Course period

Antal platser: 50
Maximum number of participants

Undervisningsspråk: English
Language of instruction

Kursens syfte samt motivering till varför den bör vara fakultetsgemensam (max 150 ord)
Aim of course and motivation as to why it should be considered “multidisciplinary” to the extent that the faculty should allocate extra financing.

Data is becoming more widely available which opens up for game changing possibilities to teach machines to autonomously analyze, learn, and act based this data without human intervention. The development of these data-driven methods has enabled solutions to previously unsolved problems and are by many considered to be the new electricity of today’s society. The most popular and successful set of methods driving this revolution is called deep learning.

This course will provide a PhD level introduction into the area of deep learning that is suitable for participants from many different departments. Today deep learning methods outperform domain-specific techniques in a broad set of areas ranging from medicine, physics and biology to information technology, engineering science and computer science making. This makes knowledge of deep learning relevant for most scientific fields dealing with data, which is the main reason as to why we hope that this course will attract participants from several departments at UU.

Kursinnehåll, kursens uppläggning samt examinationsform (max 150 ord)
Contents, study format and form of examination

Lecture series: 8-10 lectures, (2 hours each). The lectures are given by the teachers.
Examination: 3 to 5 bigger hand-in assignments. All assignments will be focused on implementation aspects for deep learning algorithms and models. In the first exercises, some of the standard deep learning methods will be implemented from scratch, and in the last exercises a state-of-the-art high-level software library for deep learning will be used.
Project (optional): Successful projects will be awarded an additional 3 hp. This is a great mechanism to spark bigger projects and spin-off collaborations.

Målgrupp(er) (specificera ämnen/inriktningar) samt rekommenderade förkunskaper
Target group/s (specify, if possible, subject/specialization) and recommended background
Our target audience is wide. The experience we have in the group from similar courses (within machine learning) shows that it is great to have a wide target audience for a course like this. More specifically, the audience includes PhD students, researchers, interested MSc students, companies and others with an active interest in a PhD level course on Deep Learning.

**Recommended background:** Basic courses in linear algebra, probability, statistics, optimization and programming.

**Huvudansvarig institution:** Department of Information Technology
Department with main responsibility

**Andra inblandade institutioner (specificera hur).**
Other departments involved (specify how).
We expect PhD students from 5-8 departments based on previous experience.

**Kontaktperson/er (namn, e-postadress)**
Contact person (name, e-mail address)
Niklas Wahlström, niklas.wahlstrom@it.uu.se

**Anmälan om kursdeltagande till**
Application from course participants should be sent to
Niklas Wahlström

**Senast**
Not later than
1 March 2019, but the first come, first served principle applies in general. If we get more applicants than the maximum number of participants we might favor an equal distribution of participants from the different departments instead of the first come, first served principle.