FMG3100 Basic Applications of Neural Networks in Manufacturing 1.5 credits

Grundläggande tillämpningar av neurala nätverk inom tillverkning

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for FMG3100 valid from Spring 2021

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

PhD student

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After successful completion of this course, the students will be able to:

- Based on a case study proposed by the course leader, program a very basic neural network from scratch in Python
- Contextualize and use more complex neural networks with the help of Neurolab and Keras libraries
- Discuss and describe basic application of machine vision

Course contents

Engineering is experiencing a drastic change due to the ubiquitous presence of computers and internet. This fact has triggered the designation of this phenomenon as the fourth industrial revolution, and the application of the associated term Industry 4.0. One of the important components envisioned in the Industry 4.0 is artificial intelligence. It is a field within computer science that has achieved a stepwise progress in the last half a century. The last of these steps is associated with Deep learning. It is a field within machine learning that relies on artificial neural networks with multiple layers. The course aims at giving the basic understanding of an artificial neural network operation and enabling students to use the more complex neural networks for their research. The activities are tailored for PhD students in the domain of manufacturing.

Examination

- PRO1 - Project, 1.5 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

The assessment of students' work will be based mainly on the project report. If deemed appropriate students will be encouraged to publish a journal paper (with the help of the supervisors).

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.