Zurich University of Applied Sciences

School of Engineering

t.FCNN - Fuzzy Control und Neuronale Netzwerke

Person responsible for the course:	Rolf Leuenberger, leue
Credits:	4
Valid for:	2010/2011
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Learning objectives:

With the two modern technologies, Fuzzy Logic and Neural Networks, often difficult system-oriented problems can be solved in a simple manner. Based on ideas from the living nature, they are considered as bionic procedures and are part of the so-called artificial intelligence.

The students become acquainted with the outlines of both technologies so far that they are able:

. - to realize independently first applications
. - to decide if or which one of both technologies could be applied
. - to understand relevant specialized publications
. - to use the advantages of both technologies as Neuro-Fuzzy systems

Course content:

Theory of Neural Networks

. - derivation of artificial neurons from natural nerve cells
. - different network types and their practical applications
. - classifications, prognoses, pattern recognition and the restoration of disturbed data
. - control of robot movements
. - self learning of Neural Networks
. - The most important deterministic and stochastic learning methods inclusive evolutionary algorithms

Practical courses in Neural Networks

Realization of simple applications on the PC by means of MATLAB and/or the neural toolbox. Applications such as pattern recognition, data compression, classifications or a Neural Network as a learning opponent in a game

Theory of Fuzzy Logic

. - Introduction of a slim theory and their application
. - The important fundamental ideas like fuzzy sets, fuzzifikation, fuzzy inference and defuzzifikation
. - fuzzy control and fuzzy pattern recognition

Practical courses in Fuzzy Logic

Realization of simple applications on the PC by means of MATLAB and the fuzzy tool box : Fuzzy decision system, fuzzy control of movements, fuzzy control of a simple mechanical system.

Previous knowledge:

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Teaching method:

Type of lesson:	Number of lessons per week:
Lecture	14x2L
Tutorial/Practicum	7x4L
Group teaching	
Block instruction	
Seminar	

Assessment:

According to the table or as specified in writing by the lecture at the beginning of the semester!

Number	Type	Weighting
1	End of term exam	100 %
	Exam during the semester	
	Further assessments	

Language of instruction:

Deutsch

Instruction material:

1 Script: Fuzzy Control, 1 Script: Neuronale Netzwerke, Übungsunterlagen

Comments:

During the course an exercise test takes place, which will be corrected and discussed but will not contribute to the final result.