MASTER OF SCIENCE IN ENGINEERING

Supplementary Course (EVA) at ZHAW School of Engineering

Title: Quantum Machine Learning

Short Code: mEVA_QML

Credits	3
Profile	Computer Science (CS)
Responsible Institute /Centre	Institute of Computer Science (InIT)
Responsible lecturer and contact informtion	Dr. Pavel Sulimov suli@zhaw.ch, Prof. Dr. Kurt Stockinger stog@zhaw.ch, Prof. Dr. Rudolf Füchslin furu@zhaw.ch
Type and duration of examinations	Presentations (pass/fail)
Start date and duration	Semester: Spring semester Detail: 18.02.2026
Location	Winterthur/Zürich
Course type	Seminar
Language of instruction	English
Short description (max. 300 characters)	The goal of this course is to explore the intersection of quantum computing and machine learning to apply quantum algorithms for pattern recognition, optimization, and predictive analytics. Quantum machine learning algorithms have the potential to unlock new insights from large datasets, accelerate model training processes, and enable more accurate predictions in various domains.
Contents and Learning Objectives	Learning objectives: - Understand the quantum advantage applied to machine learning. - Learn to implement quantum machine learning models in real-life cases. - Execute programs on an IBM quantum computer. Module content: - Quantum basics, key differences between classical and quantum machine learning, quantum advantage. - Experimenting with different data types (tabular, text, image, speech) and implementations of quantum ansätze. - Constructing a basic hybrid classical-quantum neural network, modifications of hybrid architecture. - Tricks for training quantum neural networks (non-linearity, overfitting etc.). - Solve a specific problem in a team. · Presentations of results.
Prerequisites	- Machine learning concepts (deep learning is an advantage but not obligatory).

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	- Basic knowledge in matrix manipulation / linear algebra.			
Literature	Lecture materials			
Special requirements	N/A			
Offer for profiles	Aviation (Avi)	☒	Business Engineering (BE)	☒
	Computer Science (CS)	☒	Data Science (DS)	☒
	Electrical Engineering (EIE)	☒	Energy & Environment (EnEn)	☒
	Mechanical Engineering (ME)	☒	Mechatronics & Automation (MA	☒
	Medical Engineering (Med)	☒	Photonics (Pho)	☒
	Information and Cyber Security (ICS)	☒	Civil Engineering (CE)	☒