Introduction to Deep Learning

Summer

(in German: Introduction to Deep Learning)

Module-ID: FIN-INF-120521

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
IDL	6	Summer	starting at 1.	1 Semester	english	Master

Link:	LSF
Limited accessability:	true
Responsibility:	Sebastian Stober
Lecturer:	Sebastian Stober
Classes:	• Lecture *Introduction to Deep Learning* • Exercise class *Introduction to Deep Learning*
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Informatik - M.Sc. DKE: Learning Methods and Models for Data Science - M.Sc. DE: Methoden der Informatik - M.Sc. VC: Computer Science

Intended learning outcomes:
Students ...

- confidently apply DL techniques to develop a solution for a given problem

- follow recent DL publications and critically assess their contributions
- formulate hypotheses and design & conduct DL experiments to validate them
- document progress & design decisions for reproducibility and transparency
- have advanced competencies in scientific research in topics of the module

Content:

- Artificial neural network fundamentals (gradient descent & backpropagation, activation functions)
- Network architectures (Convolutional Neural Networks, Recurrent/Recursive Neural Networks, Auto-Encoders, Transformers)
- Regularization techniques
- Introspection & analysis techniques
- Optimization techniques
- Advanced training strategies (e.g. teacher-student)

Workload:

- 56h contact hours (2 SWS lecture + 2 SWS exercise groups)
- 124h self study (reading assignments (flipped classroom), programming exercises)

Pre-examination requirements:	Type of examination:	Teaching method / lecture hours per week (SWS):
	Exam requirements: participation and active involvement in the course and the exercises (defined in the 1st lecture and published on the course website) Final exam: written (120 minutes) Schein: pass final exam (at least 4.0)	• Lecture (2 SWS) • Exercise (2 SWS)

Prerequisites according to examination regulations:	Recommended prerequisites:
keine	Machine Learning (required)

Media:	Literature:
	Ian Goodfellow, Yoshua Bengio & Aaron Courville: "Deep Learning", MIT Press, 2016.

Comments:

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