

## Electives

Designation	Pillar	Lecturer(s)	SWS	ECTS	WiSe	SoSe	Language
Advanced Deep Learning	ML	Prof. Dr. Breininger	2+2	5.0		x	ENG
Advanced Design and Programming	SA	Prof. Dr. Dirk Riehle	4	5.0	x		GER
Advanced Programming Techniques	SA	Prof. Dr. Harald Köstler	4	7.5	x		ENG
AI Software Applications	SA	Prof. Dr. Dirk Riehle	2	5.0		x	GER/ENG
Algebra of Programming	Sym	Prof. Dr. L. Schröder, Prof. Dr. Stefan Milius	4	7.5		x	GER/ENG
Algebraic and Logical Aspects of Automata Theory	Sym	Prof. Dr. Stefan Milius, Dr. Henning Urbat	4	7.5	x		GER/ENG
Algorithmic Bioinformatics	ML	Prof. Dr. David B. Blumenthal	2+2	5.0	x		GER
Approximate Computing	SA	Prof. Dr. Keszöcze, Prof. Dr. Teich	2+2	5.0		x	GER/ENG
Artificial Intelligence I	Sym	Prof. Dr. Kohlhase	4+2	7.5	x		ENG
Artificial Intelligence II	ML	Prof. Dr. Kohlhase	4+2	7.5		x	ENG
Artificial Motor Learning	SA	Prof. Dr. Seel	4	5.0		x	GER
Biomedical Signal Analysis	ML	Dr. Felix Kluge, Prof. Eskofier	2+2	5.0	x		ENG
Cognitive Neuroscience for AI Developers	SA	Dr. Patrick Krauss	2+2	5.0		x	ENG
Computational Magnetic Resonance Imaging	SA	Prof. Dr. Knoll	2+2	5.0	x		ENG
Computational Neurotechnology / Numerische Neurotechnologie	ML	Prof. Dr. Tobias Reichenbach	2+2	5.0		x	GER
Computational Photography and Capture	SA	Prof. Dr. Tim Weyrich	2+2	5.0		x	GER/ENG
Computational Visual Perception	SA	Prof. Dr. Andreas Kist, Marc Stamminger, Prof. Egger	4+2	7.5	x		ENG
Computer Architecture	SA	Prof. Dr. Dietmar Fey	2+2	5.0	x		GER/ENG
Computer Architecture	SA	Prof. Dr. Dietmar Fey	2+2+2	7.5	x		GER/ENG
Computer Vision	ML	Ph Ronak Kosti, Dr. Vincent Christlein	2+2	5.0		x	GER
Connected Mobility and Autonomous Driving	Sym	Dr. Anatoli Djanatliev	2+2	5.0	x		ENG
Deep Learning	ML	Prof. Dr. Andreas Maier	2+2	5.0	x		ENG
Description Logic and Formal Ontologies	Sym	Prof. Dr. Schröder	4	7.5	x		GER/ENG
Eingebettete Systeme	SA	Prof. Dr. Teich	2+2	5.0	x		GER
Eingebettete Systeme mit erweiterten Übungen	SA	Prof. Dr. Teich		7.5	x		GER
Formal Verification	Sym	PD Dr. Tadeusz Litak, Paul Wild	4	7.5	x		GER/ENG
Human Computer Interaction	SA	Prof. Dr. Eskofier	3+1	5.0		x	ENG
Human-Robot Co-Adaptation	SA	Prof. Dr. Claudio Castellini	4	5.0	x		GER/ENG
Inertial Sensor Fusion	SA	Prof. Dr. Seel	4	5.0	x		ENG
Informationsvisualisierung	SA	Dr. Roberto Grosso	2+2	5.0		x	GER
Intent Detection and Feedback	SA	Prof. Dr. Castellini / Egle	4	5.0		x	GER/ENG
Interventional Medical Image Processing	ML	Julian Hoßbach, Prof. Dr. Maier, Tristian Gottschalk	4+4	5.0	x		ENG
Introduction to Explainable Machine Learning	ML	Prof. Dr. Seel	4	5.0		x	GER/ENG
Kommunikation und parallele Prozesse	Sym	Dr. Sergey Goncharov und Prof. Dr. Lutz Schröder	4	7.5	x	x	GER
Logic-Based Representation of Mathematical/Technical Knowledge	Sym	Prof. Dr. Kohlhase/PD Dr. Rabe	4	5.0		x	GER/ENG
Logik-Basierte Sprachverarbeitung	Sym	Prof. Dr. Kohlhase, PD Dr. Florian Rabe	4	5.0	x		GER
Machine Learning for Time Series Deluxe	ML	Prof. Eskofier, Prof. Oliver Amft, Dr. Ch. Mutschler	2+2+2	7.5	x		ENG
Machine Learning for Time Series	ML	Prof. Eskofier, Prof. Oliver Amft, Dr. Ch. Mutschler	2+2	5.0	x		ENG
Medical Image Processing for Diagnostic Applications	ML	Julian Hoßbach, Prof. Dr. Maier, Tristian Gottschalk	4+4	5.0	x		ENG
Middleware - Cloud Computing	SA	Dr. Distler, Michael Eischer, Laura Lawniczak	4	5.0	x		GER
Middleware - Cloud Computing (EÜ)	SA	Dr. Distler, Michael Eischer, Laura Lawniczak	4	7.5	x		GER
Modallogik	Sym	Dr. Daniel Hausmann	4	7.5		x	GER
Modeling, Optimization and Simulation of Energy Systems	SA	Prof. Dr. Pruckner	2+2	5.0	x		GER/ENG
Monad-based Programming	Sym	Dr. Sergey Goncharov	4	7.5	x	x	GER/ENG
Multimedia Security	ML	Dr. Riess	2+2	5.0	x		ENG
Music Processing Analysis	ML	Prof. Dr. Meinard Müller	2+2	5.0	x		ENG

Nonclassical Logics in Computer Science	Sym	Prof. Dr. L. Schröder, PD Dr. Tadeusz Litak	4	7.5	x		GER/ENG
Parallele Systeme	SA	PD Dr. Frank Hannig, Prof. Dr. Teich	2+2	5.0		x	GER
Parallele Systeme mit erweiterten Übungen	SA	PD Dr. Frank Hannig, Prof. Dr. Teich	2+2	7.5		x	GER
Pattern Analysis	ML	Dr. Christian Riess	3+1	5.0		x	GER
Pattern Recognition	ML	Prof. Dr. Andreas Maier	3+1+2	5.0	x		ENG
Practical Semantics of Programming Languages	Sym	PD Dr. Tadeusz Litak	4	7.5		x	GER/ENG
Reinforcement Learning	ML	Christopher Mutschler	2+2	5.0		x	GER/ENG
Speech and Language Processing	ML	Prof. Dr. Andreas Maier	2+2	5.0		x	GER
Speech and Language Understanding	ML	Prof. Dr. Yang	4	5.0		x	ENG
Swarm Intelligence	SA	Prof. Dr. Rolf Wanka	2+2	5.0		x	GER
Verifikation digitaler Systeme	Sym	Prof. Dr. Oliver Keszöcze	2+2	5.0	x		GER
Verteilte Systeme	SA	Dr. Jürgen Kleinöder	2+2	5.0		x	GER
Verteilte Systeme erweiterte Übungen	SA	Dr. Jürgen Kleinöder, Dr. Tobias Distler	2+2	7.5		x	GER
Visual Computing in Medicine	ML	PD Dr. Wittenberg, PD Dr. Hastreiter	2+2	5.0	x	x	ENG
Wissensrepräsentation und -verarbeitung	Sym	PD Dr. Rabe/Prof. Dr. Kohlase	4+2	7.5	x		GER

## Projects

Designation	Pillar	Lecturer(s)	SWS	ECTS	WiSe	SoSe	Language
AI 1 Systems Project	Sym	Prof. Dr. Kohlase	4	10.0	x		ENG
AI 2 Systems Project	ML	Prof. Dr. Kohlase	4	10.0		x	ENG
AI Project: Computational Visual Perception	SA	Prof. Dr. Egger	4	10.0	x	x	GER/ENG
Applied Neural Engineering	ML	Prof. Dr. Del Vecchio	4	10.0	x		ENG
Biomedical Image Analysis Project	ML	Prof. Dr. Andreas Kist	4	10.0		x	GER/ENG
Computational Imaging Project	SA	Prof. Dr. Knoll	8	10.0	x	x	GER/ENG
Computer Architectures for Deep Learning Applications	SA	Dr. Marc Reichenbach / Prof. D. Fey	8	10.0	x		GER/ENG
Hands on Rehabilitation and Assistive Robotics	SA	Prof. Dr. Castellini		5.0			GER/ENG
Innovationslabor für Wearable und Ubiquitous Computing	ML	Prof. Dr. Eskofier / Matthias Zürl	4	10.0	x	x	ENG
Intelligent Sensorimotor Systems Lab	SA	Prof. Dr. Seel	4	10.0	x	x	ENG
Legal AI	ML	Jannick Preiwisch		5.0			GER/ENG
Legged Locomotion of Robots Deluxe	ML	Prof. Dr. Koelewijn	4	5.0		x	GER/ENG
Master Projekt Datenmanagement	ML	Prof. Lenz	4	10.0		x	GER
Neurotechnology Project	ML	Prof. Dr. Tobias Reichenbach		10.0			GER/ENG
Project Biomedical Network Science	SA	Prof. Dr. David B. Blumenthal	4	10.0	x	x	ENG
Project Computer Vision	ML	Dr. Christlein	4	10.0	x	x	GER/ENG
Project Digital Reality	SA	Prof. Dr. Weyrich	6	10.0	x	x	GER/ENG
Project Intraoperative Imaging and Machine Learning	ML	Prof. Dr. Breininger	2	5.0	x		ENG
Project Music and Audio Processing	SA	Prof. Dr. Meinard Müller	4	10.0	x	x	ENG
Project on Applied AI in Factory Automation and Production Systems	SA	Prof. Dr.-Ing. Jörg Franke	8	10.0	x	x	GER/ENG
Project Representation Learning	ML	Prof. Dr. Kainz	8	10.0	x	x	ENG
Projekt Applied Software Engineering	SA	Prof. Dr. Dirk Riehle	0	10.0	x	x	GER
Projekt Künstliche Intelligenz	Sym	Prof. Kohlase	4	10.0	x	x	GER
Projekt Machine Learning and Data Analytics	ML	Prof. Eskofier	4	10.0	x	x	GER/ENG
Projekt Pattern Recognition	ML	Dr. Christlein	4	10.0	x	x	GER/ENG
Rehabilitation and Assistive Robotics Research Lab	SA	Prof. Dr. Castellini		5.0			GER/ENG
Selected Projects in Computer Graphics	SA	Prof. Dr.-Ing. Marc Stamminger	4	10.0	x	x	GER/ENG
Surgical Robotics	SA	Prof. Dr. Franziska Mathis-Ullrich	?	?	x	x	ENG
The AMOS Project: Agile Methods and Open Source	SA	Prof. Dr. Dirk Riehle	4	10.0		x	ENG
Virtual and Augmented Reality	SA	Prof. Dr. Roth	4	10.0		x	ENG

## Seminars

Designation	Pillar	Lecturer(s)	SWS	ECTS	WiSe	SoSe	Language
Advanced Simulation Technology	-	Prof. Dr. Harald Köstler	2	5.0		x	GER/ENG
Advanced Topics in Human-Computer-Interaction	-	Prof. Dr. Roth	4	5.0	x		GER/ENG
Big Data Seminar	-	Prof. Dr. Richard Lenz	2	5.0	x		GER
Blender Seminar	-	Prof. Dr.-Ing. Marc Stamminger	2	5.0		x	GER/ENG
Blickfang: KI-getriebene Modellierung und Analyse von Eye-Tracking-Daten	-	Dr. Zanca	2	2.5		x	GER
Cognitive Surgical Robotics	-	Prof. Dr. Franziska Mathis-Ullrich	?	?	x	x	GER/ENG
Digital Psychology Lab	-	Prof. Dr. Eskofier / Robert Richer / Maximilian Rohleder	2	5.0	x		GER
Erweitertes maschinelles Lernen für Anomalieerkennung	-	Prof. Dr. Kainz	2	2.5	x	x	GER
Ethics in AI	-	Dr. Christoph Merdes	2	2,5	x		GER/ENG
Ethics and Philosophy of AI	-	Prof. Dr. Vincent Müller	2	5.0		x	GER/ENG
Fantastic datasets and where to find them	-	Prof. Dr. Kist	2	2.5	x	x	ENG
Green AI: AI for sustainability and sustainability of AI	-	Prof. Dr. Eskofier / Eva Dorschky	2	5.0	x	x	ENG
Humans in the Loop: The Design of Interactive AI Systems	-	Prof. Dr. Kainz	2	5.0	x		ENG
Legged Locomotion of Robots	-	Prof. Dr. Koelewijn	2	2.5		x	GER/ENG
Machine Learning in MRI	-	Florian Knoll		5.0			GER/ENG
Nailing your Thesis (Anleitung zum wissenschaftlichen Arbeiten)	-	Prof. Dr. Dirk Riehle	2	5.0		x	GER/ENG
Neurosciene-inspired Artificial Intelligence	-	Patrick Krauss, Achim Schilling, Andreas Maier		5.0			GER/ENG
Philosophy of AI	-	Dr. Christoph Merdes	2	2,5		x	GER/ENG
Philosophie und Künstliche Intelligenz (KI)	-	Prof. Dr. Vincent Müller	2	5.0		x	GER
Seminar Advanced Deep Learning	-	Prof. Dr. Breininger	2	5.0		x	ENG
Seminar Automata over Infinite Words	-	Prof. Dr. L. Schröder	2	5.0			GER/ENG
Seminar Co-algebraic Logic	-	Prof. Dr. L. Schröder	2	5.0			GER/ENG
Seminar Computer Vision	-	Prof. Dr. A. Maier/Dr. Christlein	2	5.0		x	GER/ENG
Seminar Deep Learning	-	Prof. Dr. A. Maier/Dr. Christlein	2	5.0	x		GER/ENG
Seminar Ethik der Digitalisierung	-	Immanuel Lautner	?	?		x	GER
Seminar Graphical Data Processing	-	Prof. Dr. Tobias Günther	2	5.0	x		GER/ENG
Seminar Inverse Rendering	-	Prof. Dr. Weyrich	2	5.0		x	GER/ENG
Seminar Machine Learning and Data Analytics for Industry 4.0	-	Prof. Eskofier et al.	2	5.0	x		ENG
Seminar Multi-Core Architectures and Programming	-	PD Dr. Frank Hannig et al.	2	5.0		x	GER/ENG
Seminar Network Medicine	-	Prof. Dr. David B. Blumenthal	2	5.0			ENG
Seminar Nominal Quantities and Automation	-	Prof. Dr. L. Schröder	2	5.0			GER/ENG
Seminar Novel Computer Architechtures	-	Dr. Marc Reichenbach / Prof. Dietmar Fey	2	5.0		x	GER/ENG
Seminar Surgical Robotics Hardware	-	Prof. Dr. Franziska Mathis-Ullrich	?	?	x	x	GER/ENG
Seminar Surgical Robotics Software	-	Prof. Dr. Franziska Mathis-Ullrich	?	?	x	x	GER/ENG
Seminar Theoretische Informatik	-	Prof. Dr. L. Schröder	2	5.0	x	x	GER
Seminar Visual Computing	-	Prof. Dr.-Ing. Tobias Günter / Prof. Dr. Tim Weyrich	2	5.0	x		GER
Seminar Wissenrepräsentation und verarbeitung	-	Prof. Dr. Kohlhase/PD Dr. Rabe	2	5.0	x	x	GER
Surgical Robotics	-	Prof. Dr. Franziska Mathis-Ullrich	?	?	?	?	GER/ENG
Tracking Olympiad	-	Prof. Dr. Kist	4	5.0		x	GER/ENG

- Sym = Symbolic AI
- ML = Subsymbolic AI / Machine Learning
- SA = AI Systems and Applications