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Module EIT-ISE-704-M-7

Technical Cognition Systems and their MEMS-Based Implementation (M, 3.0 LP)

Module Identification

Module Number	Module Name	CP (Effort)
EIT-ISE-704-M-7	<i>Technical Cognition Systems and their MEMS-Based Implementation</i>	3.0 CP (90 h)

Basedata

CP, Effort	3.0 CP = 90 h
Position of the semester	1 Sem. in SuSe
Level	[7] Master (Advanced)
Language	[DE/EN] German or English as required
Module Manager	König, Andreas, Prof. Dr.-Ing. (PROF DEPT: EIT) (/staff/343/)
Lecturers	König, Andreas, Prof. Dr.-Ing. (PROF DEPT: EIT) (/staff/343/)
Area of study	[EIT-ISE] Integrated Sensor Systems
Reference course of study	[EIT-88.781-SG#2010] M.Sc. Electrical and Computer Engineering [2010] (/mhb/FB-EIT/cos-556/)
Lifecycle-State	[NORM] Active

Courses

Type/SWS	Course Number	Choice in Module-Part	SL	PL	CP	Sem.
2S	EIT-ISE-704-K-7 (/mhb/courses/EIT-ISE-704-K-7/)	P	SEM-Schein	PL1	3.0	SuSe

- About [EIT-ISE-704-K-7]: Title: "Technical Cognition Systems and their MEMS-Based Implementation"; Presence-Time: 28 h; Self-Study: 62 h
- About [EIT-ISE-704-K-7]: The study achievement [SEM-Schein] **proof of successful participation in the seminar** must be obtained. It is a prerequisite for the examination for PL1.

Examination achievement PL1

- Form of examination: **combination of talk and written elaboration**
- Examination Frequency: each semester

Evaluation of grades

The grade of the module examination is also the module grade.

Contents

From [EIT-ISE-704-K-7] **Technical Cognition Systems and their MEMS-Based Implementation** (/mhb/courses/EIT-ISE-704-K-7/);

- Fehlertolerante, robuste Signalverarbeitung
- Evolvable Hardware
- Organic Computing, Ambient Intelligence
- Systeme mit Self-X-Eigenschaften, z. B. Selbstreparatur
- Puls- bzw. Spike-kodierte Informationsverarbeitung, Prinzip und technische Anwendung, z.B. zur Sensordatensignalkonditionierung und A/D-Wandlung
- Adaptive Systeme, insbesondere lokale Adaptionsmechanismen
- Bio-Inspirierte Informationsverarbeitungs- und Rechnersysteme
- Bionik
- Chaos, Fraktale und nichtlineare Systeme
- Dimensionsreduktion, Analyse und Visualisierung großer hochdimensionaler Sensordatenbestände, Big Data
- Blind-Source-Separation und Independent-Component-Analysis
- Neuheits- bzw. Anomaliedetektion und Einklassenklassifikation
- Verteilte autonome bzw. autarke integrierte intelligente Systeme
- Fortgeschrittene AVT, 3D-Integration und 3D-Druck für die kosteneffektive Herstellung geringer Losgrößen autonomer bzw. autarker integrierter intelligenter Systeme

Competencies / intended learning achievements

- Übersicht zu einer neuen Entwicklungsrichtung im Fachgebiet erarbeiten
- Aktuellen Stand und Perspektive des vorgegebenen Themengebiets zu recherchieren und dokumentieren
- Übersicht mit Bewertung aufgearbeitet zu erstellen, präsentieren und verteidigen

Requirements for attendance (informal)

Modules:

- [EIT-DSV-531-M-4] Digital Signal Processing (M, 4.0 LP) (/mhb/modules/EIT-DSV-531-M-4/)
- [EIT-ISE-110-M-7] Neurocomputing (M, 4.0 LP) (/mhb/modules/EIT-ISE-110-M-7/)
- [EIT-ISE-112-M-7] Sensor Signal Processing (M, 5.0 LP) (/mhb/modules/EIT-ISE-112-M-7/)
- [EIT-ISE-650-M-7] Manufacturing and Design of Integrated Sensors Systems (HEIS) (M, 5.0 LP) (/mhb/modules/EIT-ISE-650-M-7/)
- [EIT-ISE-651-M-4] Technology and Design of Integrated Mixed-Signal Circuits and Systems (TESYS) (M, 5.0 LP) (/mhb/modules/EIT-ISE-651-M-4/)
- [EIT-ISE-701-M-2] Electronics I (M, 6.0 LP) (/mhb/modules/EIT-ISE-701-M-2/)
- [EIT-ISE-702-M-3] Electronics II (M, 4.0 LP) (/mhb/modules/EIT-ISE-702-M-3/)

Requirements for attendance (formal)

None

References to Module / Module Number [EIT-ISE-704-M-7]

Course of Study	Section	Choice/Obligation
[EIT-88.781-SG#2010] M.Sc. Electrical and Computer Engineering [2010] (/mhb/FB-EIT/cos-556/)	Elective Subjects	[W] Elective Module
[EIT-88.7-SG#2021] M.Sc. Electrical and Computer Engineering [2021] (/mhb/FB-EIT/cos-686/)	Technical Elective Modules	[W] Elective Module