Bauhaus-Universität Weimar

Vorlesungsverzeichnis

M.Sc. Digital Engineering

Winter 2017/18

Stand 07.05.2018

M.Sc. Digital Engineering

Fundamentals (F)

Algorithms and Datastructures

Applied Mathematics and Stochastics

2301012-1 Applied mathematics (Lecture)

K. Gürlebeck Veranst. SWS: 2
Vorlesung
Di, wöch., 13:30 - 15:00, Coudraystraße 13 A - Hörsaal 2

Beschreibung

Applied mathematics:

Fundamentals of linear algebra, eigenvalue problems, fixed point principles, solvers; Fourier series, convergence, Fourier transform, Laplace transform; Solution of initial value problems, boundary value problems and eigenvalue problems for ordinary differential equations; All topics are discussed from the mathematical point of view and their implementation in MAPLE will be studied. :

Leistungsnachweis
Klausur oder mündliche Prüfung

2301012-2 Stochastics for risk assessment (Lecture) / Mathematics for risk management (MBM)

T. Lahmer Veranst. SWS: 2
Vorlesung
Fr, Einzel, 11:00 - 12:30, Marienstraße 13 C - Hörsaal B, Prüfung, 09.02.2018 - 09.02.2018
Mo, wöch., 13:30 - 15:00, Marienstraße 13 C - Hörsaal B, Prof. Lahmer

Beschreibung

Stochastics for risk assessment:

Introduction to probability theory with focus on situations characterized by low probabilities. Random events, discrete and continuous random variables and associated distributions. Descriptive statistics, parameter estimation. Risk Assessment by means of FORM and Monte Carlo Simulations. Introduction to reliability theory: Extreme value distributions; stochastic modeling with software tools e.g. MATLAB, Octave, Excel, R. Reliability Analysis of Systems. Catastrophic events + risk problems, Applications

Leistungsnachweis
Klausur oder mündliche Prüfung

Nonlinear Continuum Mechanics

Numerical Linear Algebra

Software Engineering

417290000 Software Engineering (M.Sc.)

F. Echtler Veranst. SWS: 3

Vorlesung

Di, wöch., 09:15 - 10:45, Bauhausstraße 11 - Seminarraum 013, Lecture, ab 10.10.2017
Fr, wöch., 13:30 - 15:00, Bauhausstraße 11 - Seminarraum 013, Lab, ab 13.10.2017
Do, Einzel, 09:00 - 11:00, Marienstraße 13 C - Hörsaal B, exam, 08.02.2018 - 08.02.2018

engl. Beschreibung

Software Engineering (M.Sc.)

Developing software requires more than just programming skills. Answering conceptual questions is perhaps even more important than excellent knowledge of a programming language. This course introduces participants to the basics of structured software development. During the course of a larger development project, the presented techniques will be exercised in practice. Topics include all phases of the development process, such as requirements analysis, UML modelling, design patterns or agile development.

Voraussetzungen

programming skills

Leistungsnachweis

Exercise assignments + written exam

Statistics

Structural Dynamics

2401007-2 Structural Dynamics (Exercise)

V. Zabel Veranst. SWS: 1

Seminar

1-Gruppe Di, wöch., 07:30 - 09:00, Marienstraße 7 B - Seminarraum 205, Tutorium - Group A
1-Gruppe Mi, wöch., 07:30 - 09:00, Marienstraße 7 B - Projektraum 302, Group A, bis 06.12.2017
2-Gruppe Di, wöch., 07:30 - 09:00, Marienstraße 7 B - Seminarraum 206, Tutorium - Group B
2-Gruppe Di, wöch., 09:15 - 10:45, Marienstraße 7 B - Projektraum 302, Group B, bis 05.12.2017
3-Gruppe Mi, wöch., 07:30 - 09:00, Marienstraße 7 B - Seminarraum 205, Tutorium - Group C
3-Gruppe Mi, wöch., 09:15 - 10:45, Marienstraße 7 B - Projektraum 302, Group C, bis 06.12.2017

2401007-2 Structural Dynamics (Lecture)

V. Zabel Veranst. SWS: 2

Vorlesung

Mi, Einzel, 09:00 - 10:30, Marienstraße 7 B - Seminarraum 105, 07.02.2018 - 07.02.2018
Mi, Einzel, 09:00 - 10:30, Marienstraße 7 B - Seminarraum 106, 07.02.2018 - 07.02.2018
Mi, Einzel, 09:00 - 10:30, Marienstraße 7 B - Seminarraum 205, 07.02.2018 - 07.02.2018
Mi, Einzel, 09:00 - 10:30, Marienstraße 7 B - Seminarraum 206, 07.02.2018 - 07.02.2018
Mi, Einzel, 09:00 - 10:30, Marienstraße 7 B - Seminarraum 103, 07.02.2018 - 07.02.2018
Mi, wöch., 11:00 - 12:30, Marienstraße 13 C - Hörsaal C, bis 29.11.2017
Do, wöch., 09:15 - 10:45, Marienstraße 13 C - Hörsaal C, bis 30.11.2017

Beschreibung

Structural Dynamics: (50% of semester course time)

SDOF systems: free vibrations, harmonic, impulse and general excitation for undamped and damped systems, Impulse response function, frequency response function, base excitation, time step analysis: central difference

and Newmark methods; MDOF systems: modal analysis, modal superposition, modal damping, Rayleigh damping, Frequency response functions, state-space models

Voraussetzungen

Bachelor Civil Engineering

Leistungsnachweis

1 written exam: „Fundamentals of structural dynamics”/ 90 min (50%)

2401011 Applied Structural Dynamics (Exercise)

Veranst. SWS: 1

Seminar

1-Gruppe Mi, wöch., 07:30 - 09:00, Marienstraße 7 B - Projektraum 302, Group A, ab 13.12.2017
2-Gruppe Di, wöch., 09:15 - 10:45, Marienstraße 7 B - Projektraum 302, Group B, ab 12.12.2017
3-Gruppe Mi, wöch., 09:15 - 10:45, Marienstraße 7 B - Projektraum 302, Group C, ab 13.12.2017

2401011 Applied Structural Dynamics (Lecture)

V. Zabel Veranst. SWS: 2

Vorlesung

Mi, wöch., 11:00 - 12:30, Marienstraße 13 C - Hörsaal C, ab 06.12.2017
Do, wöch., 09:15 - 10:45, Marienstraße 13 C - Hörsaal C, ab 07.12.2017
Fr, Einzel, 09:15 - 10:45, Marienstraße 7 B - Seminarraum 105, Tutorial, 19.01.2018 - 19.01.2018
Fr, Einzel, 09:15 - 10:45, Marienstraße 7 B - Seminarraum 106, Tutorial, 19.01.2018 - 19.01.2018
Mi, Einzel, 10:45 - 12:15, Marienstraße 7 B - Seminarraum 205, 07.02.2018 - 07.02.2018
Mi, Einzel, 10:45 - 12:15, Marienstraße 7 B - Seminarraum 206, 07.02.2018 - 07.02.2018

Structural Engineering Models

Modelling (M)

4- und 5D-Building Information Modeling (BIM)

Advanced Building Information Modeling

Advanced Modelling - Calculation

Collaborative Data Management

Computer models for physical processes – from observation to simulation

Introduction to Optimization

Modelling in the development process

Optimization in Applications

Simulation and Validation (SaV)

Design and Interpretation of Experiments / Signal Processing

Extended Finite Elements and Mesh Free Methods

Linear FEM

2401012 Applied Finite element methods (Exercise)

C. Könke Veranst. SWS: 1
Seminar
1-Gruppe Mi, wöch., 09:15 - 10:45, Marienstraße 7 B - Projektraum 301, Group A, ab 13.12.2017
2-Gruppe Mi, wöch., 07:30 - 09:00, Marienstraße 7 B - Projektraum 301, Group B, ab 13.12.2017
3-Gruppe Di, wöch., 09:15 - 10:45, Marienstraße 7 B - Projektraum 301, Group C, ab 12.12.2017

2401012 Applied Finite element methods (Lecture)

C. Könke Veranst. SWS: 2
Vorlesung
Do, wöch., 11:00 - 12:30, Marienstraße 13 C - Hörsaal C, ab 07.12.2017
Do, wöch., 13:30 - 15:00, Marienstraße 13 C - Hörsaal C, ab 07.12.2017
Fr, Einzel, 10:45 - 12:15, Marienstraße 7 B - Seminarraum 205, 16.02.2018 - 16.02.2018
Fr, Einzel, 10:45 - 12:15, Marienstraße 7 B - Seminarraum 206, 16.02.2018 - 16.02.2018

Modelling of Steel Structures and Numerical Simulation

Nonlinear FEM

Process modelling and simulation in logistics and construction

Simulation Methods in Engineering

Stochastic Simulation Techniques and Structural Reliability

Structural Health Monitoring

907004 Fundamentals of structural health monitoring (SHM) and intelligent structural systems

K. Smarsly, E. Tauscher, M. Theiler, M. Steiner, J. Wagner
Integrierte Vorlesung
Mi, wöch., 09:15 - 12:30, Coudraystraße 13 D - Pool-Raum 010

Beschreibung

Structural health monitoring (SHM) and smart structural systems, also referred to as "smart structures" or "intelligent infrastructure", are primary subjects of this course: Basic principles of modern SHM are taught; also, concepts of smart structural systems, which are capable of self-assessing their structural condition with a certain degree of intelligence, are elucidated in more detail. Measuring techniques, data acquisition systems, data management and processing as well as data analysis algorithms will be discussed. Furthermore, approaches towards autonomous and embedded computing, to be used for continuous (remote) monitoring of civil infrastructure, are presented. Throughout the course, a number of illustrative examples is shown, demonstrating how state-of-the-art SHM systems and smart structural systems are implemented. In small groups, the students design structural health monitoring systems that are validated in the field. The outcome of every group is to be documented in a paper, which is graded,

together with an oral examination, at the end of the course. Prerequisites for this course: Object-oriented modeling and Java programming language. Requirements for examination: (i) Development of a wireless SHM system, (ii) participation in the project work (including the laboratory test), (iii) written paper. No previous experience in the above fields is required by the students; limited enrollment.

Bemerkung

Please note: Time and location will be announced. Enrollment must be done online.

Information on how to enroll will be provided in the first lecture on October 11, 2017 (9:15am), Coudraystr. 13D, Orion-Pool.

Voraussetzungen

Object-oriented modeling and Java programming language.

Basic knowlegde in structural dynamics would be an advantage.

Leistungsnachweis

Oral examination and written paper.

System and Parameter Identification

Visualization and Data Science (VaDS)

Image Analysis and Object Recognition

Introduction to Machine Learning

4439110 Introduction to Machine Learning

B. Stein, M. Völske Veranst. SWS: 3

Vorlesung

Do, wöch., 09:15 - 10:45, Karl-Haußknecht-Straße 7 - Hörsaal (IT-AP), Lecture, ab 19.10.2017
Do, wöch., 11:00 - 12:30, Karl-Haußknecht-Straße 7 - Hörsaal (IT-AP), Lab class, ab 19.10.2017
Mo, Einzel, 11:00 - 13:00, Marienstraße 13 C - Hörsaal A, exam, 19.02.2018 - 19.02.2018

engl. Beschreibung

Introduction to Machine Learning

Students will learn to understand machine learning as a guided search in a space of possible hypotheses. The mathematical means to formulate a particular hypothesis class determines the learning paradigm, the discriminative power of a hypothesis, and the complexity of the learning process. Aside from foundations of supervised learning also an introduction to unsupervised learning is given. The lecture introduces concepts,algorithms, and theoretical backgrounds. The accompanying lab treats both theoretical and applied tasks to deepen the understanding of the field. Team work (2-3 students) is appreciated.

Bemerkung

Der Starttermin wird zum Anfang des Semesters auf der Webseite der Professur bekannt gegeben.

Leistungsnachweis

Klausur / written exam

Machine Learning for Software Engineering

Photogrammetric Computer Vision

4256303 Photogrammetric Computer Vision

V. Rodehorst, J. Kersten Veranst. SWS: 3

Vorlesung

Mo, Einzel, 15:15 - 16:45, Karl-Haußknecht-Straße 7 - Hörsaal (IT-AP), first Lecture , 09.10.2017 - 09.10.2017
Mo, wöch., 11:00 - 12:30, Bauhausstraße 11 - Seminarraum 015, Lecture, ab 16.10.2017
Mo, gerade Wo, 13:30 - 15:00, Bauhausstraße 11 - Seminarraum 015, Lab class , ab 23.10.2017
Mo, Einzel, 11:00 - 13:00, exam lecture hall B, Marienstr. 13C, 05.02.2018 - 05.02.2018

Beschreibung

Die Vorlesung gibt eine Einführung in die Grundlagen der Sensor-Orientierung und 3D-Rekonstruktion. Das Ziel ist ein Verständnis der Prinzipien, Methoden und Anwendungen der bildbasierten Vermessung. Behandelt werden unter anderem die algebraische projektive Geometrie, Abbildungsgeometrie, Kalibrierung, Orientierungsverfahren, Stereo-Bildzuordnung und weitere Verfahren zur Oberflächenrekonstruktion.

engl. Beschreibung

Photogrammetric Computer Vision

The lecture gives an introduction to the basic concepts of sensor orientation and 3D reconstruction. Is covers topics such as the algebraic projective geometry, imaging geometry, calibration, orientation methods, stereo image matching and other surface reconstruction methods.

Voraussetzungen

Einführung in die Informatik, Grundlagen Programmiersprachen

Leistungsnachweis

Erfolgreiche Bearbeitung der Übungen und Klausur

Search Algorithms

Software Product Line Engineering

Visualization

Elective Modules

Project

417210009 Hot Topics in Computer Vision WS17/18

V. Rodehorst, J. Kersten Veranst. SWS: 10

Projekt

Beschreibung

Die Teilnehmer werden an ein aktuelles forschungs- oder industrierelevantes Thema herangeführt. Es ist nicht beabsichtigt einen festgelegten Bereich in voller Breite zu explorieren. Stattdessen werden die Teilnehmer mit der vollen Komplexität eines begrenzten Themas konfrontiert und die Eigeninitiative gefördert. Es ermöglicht einen Einblick in die Forschungs- und Entwicklungsprojekte des Fachgebiets.

engl. Beschreibung

Hot Topics in Computer Vision WS17/18

The participants are introduced to a current research or industry-related topic. It is not intended to explore a specific area completely. Instead, the participants are confronted with the full complexity of a limited topic and to challenge their own initiative. It allows an insight into research and development of the field.

Bemerkung

Ort und Zeit werden zur Projektbörse bekannt gegeben.

Time and place will be announced at the project fair.

Voraussetzungen

Gute Programmierkenntnisse (z.B. C/C++, MATLAB, OpenCL)

Leistungsnachweis

Aktive Mitarbeit, Einführungsvortrag, Abschlusspräsentation, Dokumentation