Vorlesungsverzeichnis

M.Sc. Digital Engineering

Winter 2019/20

Stand 13.07.2020

M.Sc. Digital Engineering

Faculty Welcome for Master's Students Digital Engineering
Monday, 14th October 2019, 11.00 a.m., room 015, Bauhausstraße 11

Project fair
Monday, 14th October 2019, 5.15 p.m., Audimax, Steubenstraße 6

Fundamentals (F)

Advanced Numerical Mathematics

Algorithms and Datastructures

Applied Mathematics and Stochastics

2301012 Applied mathematics & Stochastics(Exercise)

T. Lahmer, D. Legatiuk Veranst. SWS: 2
Seminar
1-Gruppe Mo, wöch., 17:00 - 18:30, Marienstraße 13 C - Hörsaal D, 14.10.2019 - 03.02.2020
2-Gruppe Mo, wöch., 17:00 - 18:30, Marienstraße 13 C - Hörsaal B, 14.10.2019 - 03.02.2020

2301012-1 Applied mathematics (Lecture)

K. Gürlebeck Veranst. SWS: 2
Vorlesung
Di, wöch., 13:30 - 15:00, Marienstraße 13 C - Hörsaal D, 15.10.2019 - 04.02.2020
Di, Einzel, 09:00 - 12:30, Marienstraße 13 C - Hörsaal B, Final examination, 18.02.2020 - 18.02.2020
Di, Einzel, 09:00 - 12:30, Marienstraße 13 C - Hörsaal D, Final examination, 18.02.2020 - 18.02.2020

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
Mo, wöch., 13:30 - 15:00, Marienstraße 13 C - Hörsaal B, Prof. Lahmer, 14.10.2019 - 03.02.2020

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

Object-oriented Modeling and Programming in Engineering

303005 Object-oriented Modeling and Programming in Engineering

C. Koch, M. Artus Veranst. SWS: 4
Vorlesung

Mo, wöch., 15:15 - 16:45, Coudraystraße 11 C - Seminarraum/Hörsaal 001, Lecture, ab 14.10.2019
Fr, wöch., 09:15 - 10:45, Marienstraße 7 B - Projektraum 301, Lab class, ab 18.10.2019
Fr, wöch., 09:15 - 10:45, Marienstraße 7 B - Projektraum 302, Lab class , ab 18.10.2019
Mo, Einzel, 10:00 - 12:00, Coudraystraße 13 A - Hörsaal 2, 24.02.2020 - 24.02.2020

Beschreibung

Objektorientierte Modellierung und Programmierung für Ingenieure

In diesem Modul wird fundamentales Wissen vermittelt, um objektorientierte Softwarelösungen für Ingenieuraufgaben zu konzipieren und zu implementieren. Dies beinhaltet Fähigkeiten zur Analyse von Ingenieurproblemen, um entsprechende objektorientierte Modelle zu erzeugen und geeignete Algorithmen auszuwählen. Die verwendete Programmiersprache ist Java. Da die Basiskonzepte allgemeingültig beschrieben werden, werden die Studierenden in die Lage versetzt, auch andere modernen Programmiersprachen zu einzusetzen.

Inhalte:

- Kontrollstrukturen (alternatives, loops, sequences)
- Grundlegende Datenstrukturen und Algorithmen
- Prinzipien der objektorientierten Softwareentwicklung (Datenkapselung, Vererbung, Polymorphie)
- Unified Modeling Language als Werkzeug für Softwareentwurf und –dokumentation
- Entwicklung grafischer Nutzerschnittstellen mithilfe des Model-View-Controller-Entwurfsmusters

engl. Beschreibung/ Kurzkommentar

Object-oriented Modeling and Programming in Engineering

This module covers the basic knowledge needed to develop and implement object-oriented software solutions for engineering problems. This includes the ability to analyse an engineering problem, so that corresponding object-oriented models can be created and suitable algorithms can be selected. The programming language used in this module is Java. However, the since fundamental concepts are described in general, students will be able to program in other modern programming languages.

Content:

- Essential programming constructs (alternatives, loops, sequences)
- Fundamental data structures and algorithms
- Principles of object oriented software development (encapsulation, inheritance and polymorphism)
- The Unified Modeling Language as a tool for software design and documentation

Development of graphical user interfaces using the Model-View-Controller pattern

Leistungsnachweis

schriftliche Klausur

Software Engineering

417290000 Software Engineering (M.Sc.)

F. Echtler Veranst. SWS: 3
Vorlesung
Do, wöch., 13:30 - 15:00, Coudraystraße 13 B - Hörsaal 3, Lecture / Lab class, ab 17.10.2019
Di, Einzel, 13:00 - 15:00, Steubenstraße 6, Haus F - Hörsaal K20, Prüfung / Examination, 11.02.2020 - 11.02.2020

engl. Beschreibung/ Kurzkommentar

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

2401013 Structural Dynamics

V. Zabel Veranst. SWS: 4
Vorlesung
1-Gruppe Di, wöch., 07:30 - 09:00, Marienstraße 7 B – Seminarraum 205 – Exercise – Group A, 15.10.2019 - 04.02.2020
1-Gruppe Do, wöch., 07:30 - 09:00, Marienstraße 13 C – Hörsaal D – Group 1 (Group A + Group B), 17.10.2019 - 06.02.2020
2-Gruppe Di, wöch., 07:30 - 09:00, Marienstraße 7 B – Seminarraum 102 – Exercise – Group B, 15.10.2019 - 04.02.2020
2-Gruppe Fr, wöch., 07:30 - 09:00, Marienstraße 13 C – Hörsaal D – Group 2 (Group C + D), 18.10.2019 - 07.02.2020
3-Gruppe Mi, wöch., 07:30 - 09:00, Marienstraße 7 B – Seminarraum 205 – Exercise – Group C, 16.10.2019 - 05.02.2020
4-Gruppe Mi, wöch., 07:30 - 09:00, Marienstraße 7 B – Seminarraum 206 – Exercise – Group D, 16.10.2019 - 05.02.2020
Mi, wöch., 09:15 - 10:45, Marienstraße 13 C – Hörsaal B, 16.10.2019 - 05.02.2020
Do, wöch., 11:00 - 12:30, Marienstraße 13 C – Hörsaal D, 17.10.2019 - 06.02.2020

Beschreibung

Target qualifications: The students will obtain knowledge of structural dynamics, become able to understand the concepts of analyses in time and frequency domain for SDOF systems as well as the extension of these analyses to MDOF systems. Further, they will become able to apply the concepts of SDOF and MDOF system analysis to practical problems, understand the principles of action of different kinds of dynamic loading on structures, obtain knowledge about the design of remedial measures. Additionally, the students will be enabled to solve simple and more complex problems by means of a numerical tool.

Content: 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, state-space models; Continuous systems: free and forced vibrations, travelling loads; Applications: machinery induced vibrations, earthquake excitation, wind induced vibrations, human induced vibrations.

Teaching and learning forms/ Didactic concept: The theory and knowledge about applications is presented in form of lectures including examples. Parallel to the lectures, weekly computer exercises are given to enable the students to implement the learned algorithms and methods numerically such that they develop a collection of numerical tools to solve problems in the field of structural dynamics.

Workload:

In-class study / online-study 68

Self-study 82

Exam preparation 30

Voraussetzungen

ecommended requirements for participation: Fundamental knowledge on mechanics as common on Bachelor level

Leistungsnachweis

Type: Written exam

Language: English

Duration / Scope: 180 min.

Weighting: Written exam (100 %)

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

Macroscopic Transport Modelling

2909020 Macroscopic Transport Modelling

U. Plank-Wiedenbeck, J. Uhlmann, C. Winkler Veranst. SWS: 4

Integrierte Vorlesung

Di, wöch., 11:00 - 15:00, Marienstraße 7 B - Projektraum 302, 22.10.2019 - 04.02.2020
Di, wöch., 11:00 - 15:00, 05.11.2019 - 04.02.2020
Do, wöch., 13:30 - 16:45, Marienstraße 7 B - Projektraum 302, 07.11.2019 - 06.02.2020
Fr, Einzel, 13:00 - 15:00, Marienstraße 13 C - Hörsaal C, Modulprüfung, 28.02.2020 - 28.02.2020

Beschreibung

Teil A: Grundlagen

Planerische Rahmenbedingungen, Raumstrukturdaten und Netzwerke, Methodik und Verfahren, Empirische Verkehrsdaten für Verkehrsmodellentwicklungen, Verkehrserzeugung, Verkehrsverteilung, Verkehrsmittelwahl, Verkehrsumlegung, Stärken und Schwächen unterschiedlicher Modellansätze, Kalibrierung und Validierung, Prognosen- und Szenarioentwicklung

Teil B: Modellierung

Praktische Umsetzung und Anwendung, Modellierung eines Verkehrsnetzes und der Verkehrsnachfrage mit PTV VISUM, Praktische Anwendung der Theorie und kritische Betrachtung von Modellergebnissen, Präsentation der Studierenden in Gruppen

engl. Beschreibung/ Kurzkommentar

Part A: Principles

Transport planning framework, Methodology and procedures, Land-Use Data and networks, Empirical Travel Data for model developments, Trip generation, Trip distribution, Mode choice, Traffic assignment, Methods and algorithms, Strengths and weaknesses of different model approaches, Calibration and validation, Forecasting and scenario calculations

Part B: Model Development

Practical implementation and application, Modelling transport network and travel demand using PTV VISUM, Application of learned methodological approach(es) and critical reflection of the model outputs, Student presentation (group work)

Bemerkung

Beleg; Prüfungsvoraussetzung: Belegabgabe

Voraussetzungen

Teilnehmeranzahl auf 15 begrenzt. Bestätigung der Professur Verkehrssystemplanung notwendig

Bewerbung bis 09.10.2019 per Mail an vsp@bauing.uni-weimar.de. Bitte kurz den fachlichen Hintergrund und die Motivation für die Kursteilnahme schildern.

Empfohlen: Vorkenntnisse in der Modellierung/ Simulation u./o. Verkehrsplanung und-technik

Leistungsnachweis

Teil A:

Klausur (120 Min), Englisch, 50%

Teil B:

Beleg und Präsentation, Englisch, 50%

Die Belegabgabe ist Vorraussetzung für die Klausurteilnahme

Simulation and Validation (SaV)

Design and Interpretation of Experiments / Signal Processing

2205014 Design and interpretation of experiments

M. Kraus, T. Lahmer, S. Mämpel Veranst. SWS: 2

Integrierte Vorlesung

Di, wöch., 11:00 - 12:30, Coudraystraße 9 A - Hörsaal 6, 15.10.2019 - 04.02.2020
Di, wöch., 13:30 - 15:00, Coudraystraße 9 A - Hörsaal 6, Experiments in structural engineering, 15.10.2019 - 04.02.2020
Di, wöch., 17:00 - 18:30, Marienstraße 7 B - Projektraum 302, Exercise: Signal Processing, Design of Experiments and System Identification, 15.10.2019 - 04.02.2020
Do, Einzel, 14:00 - 16:30, Marienstraße 13 C - Hörsaal D, 27.02.2020 - 27.02.2020

Experimental Structural Dynamics

Extended Finite Elements and Mesh Free Methods

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

2907004 Fundamentals of structural health monitoring (SHM) and intelligent structural systems

K. Smarsly, S. Ibañez Sánchez, M. Mirboland, J. Wagner

Integrierte Vorlesung

Mi, wöch., 09:15 - 12:30, Coudraystraße 11 C - Pool-Raum 101, 16.10.2019 - 05.02.2020

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 16, 2019 (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.

Linear FEM

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

Finite Element Methods (FEM)

419240000 Finite Element Methods (FEM)

C. Könke Veranst. SWS: 4

Vorlesung

1-Gruppe Mi, wöch., 07:30 - 09:00, Marienstraße 7B - PC-Pool Luna-blue - Exercise - Group A, 16.10.2019 - 05.02.2020
1-Gruppe Do, wöch., 09:15 - 10:45, Marienstraße 13C - Hörsaal D - Group 1 (Group A + Group B), 17.10.2019 - 06.02.2020
2-Gruppe Mi, wöch., 07:30 - 09:00, Marienstraße 7B - PC-Pool Luna-grey - Exercise - Group B, 16.10.2019 - 05.02.2020
2-Gruppe Fr, wöch., 13:30 - 15:00, Marienstraße 13 C – Hörsaal D – Group 2 (Group C + Group D), 18.10.2019 - 07.02.2020
3-Gruppe Di, wöch., 07:30 - 09:00, Marienstraße 7 B – PC-Pool Luna-blue – Exercise– Group C, 15.10.2019 - 04.02.2020
4-Gruppe Di, wöch., 07:30 - 09:00, Marienstraße 7 B – PC-Pool Luna-grey – Exercise– Group D, 15.10.2019 - 04.02.2020
Mo, wöch., 15:15 - 16:45, Marienstraße 13C - Hörsaal B (Lecture), 14.10.2019 - 03.02.2020
Mi, wöch., 11:00 - 12:30, Marienstraße 13C - Hörsaal B (Lecture), 16.10.2019 - 05.02.2020

Beschreibung

Strong and weak form of equilibrium equations in structural mechanics, Ritz and Galerkin principles, shape functions for 1D, 2D, 3D elements, stiffness matrix, numerical integration, Characteristics of stiffness matrices, solution methods for linear equation systems, post-processing and error estimates, defects of displacements based formulation, mixed finite element approaches.

Voraussetzungen

Bachelor Civil Engineering

Leistungsnachweis

1 written exam: „Fundamentals of finite element methods”/ 90 min (50%)

Visualization and Data Science (VaDS)

Image Analysis and Object Recognition

Introduction to Machine Learning

4439110 Introduction to Machine Learning

B. Stein, W. Chen, M. Völske Veranst. SWS: 3

Vorlesung

Do, wöch., 09:15 - 10:45, Marienstraße 13 C - Hörsaal C, ab 24.10.2019
Do, wöch., 11:00 - 12:30, Marienstraße 13 C - Hörsaal C, ab 24.10.2019
Mi, Einzel, 13:30 - 15:00, Marienstraße 13 C - Hörsaal C, Zusatztermin Übung, 12.02.2020 - 12.02.2020
Fr, Einzel, 10:00 - 12:00, Steubenstraße 6, Haus F - Hörsaal K20, Prüfung, 14.02.2020 - 14.02.2020

engl. Beschreibung/ Kurzkommentar

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.

The date of the first lecture will be announced on the websites of the professorship, at the beginning of the semester.

Leistungsnachweis

Klausur / written exam

Photogrammetric Computer Vision

4256303 Photogrammetric Computer Vision

V. Rodehorst, M. Kaisheva Veranst. SWS: 3

Vorlesung

Mo, Einzel, 13:30 - 15:00, Bauhausstraße 11 - Seminarraum 015, first lecture , 14.10.2019 - 14.10.2019
Mo, wöch., 11:00 - 12:30, Bauhausstraße 11 - Seminarraum 015, Lecture, ab 21.10.2019
Mo, wöch., 13:30 - 15:00, Bauhausstraße 11 - Seminarraum 015, Lab class, ab 21.10.2019
Mo, Einzel, 15:30 - 17:30, Steubenstraße 6, Haus F - Hörsaal K20, Prüfung/ Examination, 17.02.2020 - 17.02.2020

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/ Kurzkommentar

The lecture gives an introduction to the basic concepts of sensor orientation and 3D reconstruction. The goal is an understanding of the principles, methods and applications of image-based measurement. It 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

Ein abschließendes Projekt wird separat bewertet und erhält zusätzliche 1.5 ECTS.

An optional final project is graded separately and awarded additional 1.5 ECTS argi

419240045 Photogrammetric Computer Vision - Final Project

V. Rodehorst, M. Kaisheva Veranst. SWS: 1
Independent Study

Voraussetzungen

Erfolgreiche Teilnahme an der Vorlesung " Photogrammetric Computer Vision"

Leistungsnachweis

Abschlusspräsentation

Search Algorithms

Search-Based Software Engineering

Software Product Line Engineering

Visualization

Real-time Rendering

419240043 Real-time Rendering

R. Carmona Suju, S. Beck, A. Kreskowski Veranst. SWS: 3
Vorlesung
Mi, wöch., 11:00 - 12:30, Bauhausstraße 11 - Seminarraum 015, Lecture, ab 16.10.2019

Mo, wöch., 09:15 - 10:45, Bauhausstraße 11 - Pool-Raum 128, Group 1, ab 28.10.2019
Di, wöch., 09:15 - 10:45, Bauhausstraße 11 - Pool-Raum 128, Group 2, ab 29.10.2019
Do, Einzel, 10:00 - 12:00, Steubenstraße 6, Haus F - Hörsaal K20, Examination / Prüfung, 20.02.2020 - 20.02.2020

Beschreibung

Dozent: Prof. Rhadamés Carmona, PhD

Ziel dieser Vorlesung ist es, den Studierenden die theoretischen und angewandten Grundlagen für das Design und die Analyse effizienter Algorithmen für Probleme mit geometrischem Input und Output zu vermitteln. Der Kurs konzentriert sich auf Echtzeitprobleme in 2D- und 3D-Computergraphik- und Visualisierungsanwendungen.

Durch diese Vorlesung erlernen Studierende grundlegende und fortgeschrittene Algorithmen und Datenstrukturen zur Lösung konkreter Probleme auszuwählen, anzupassen und zu implementieren. Darüber hinaus sollen sie in der Lage sein, die Komplexität der Algorithmen und Datenstrukturen zu analysieren.

Die begleitenden Übungen vermitteln den Studierenden die notwendigen Fähigkeiten, um ausgewählte Algorithmen zu implementieren und zu testen.

Voraussetzungen

Decent programming skills needed.

Knowledge of C++ is helpful for the lab classes, but other programming languages might be used as well. Completion of course Algorithms and Datastructures or similar courses is an ideal prerequisite for successful participation.

Leistungsnachweis

Vorlesungsbegleitende, bewertete Übungen, mündliche oder schriftliche Prüfung. Ein abschließendes Projekt wird separat bewertet und erhält zusätzliche 1.5 ECTS.

Elective Modules

2909020 Macroscopic Transport Modelling

U. Plank-Wiedenbeck, J. Uhlmann, C. Winkler Veranst. SWS: 4
Integrierte Vorlesung
Di, wöch., 11:00 - 15:00, Marienstraße 7 B - Projektraum 302, 22.10.2019 - 04.02.2020
Di, wöch., 11:00 - 15:00, 05.11.2019 - 04.02.2020
Do, wöch., 13:30 - 16:45, Marienstraße 7 B - Projektraum 302, 07.11.2019 - 06.02.2020
Fr, Einzel, 13:00 - 15:00, Marienstraße 13 C - Hörsaal C, Modulprüfung, 28.02.2020 - 28.02.2020

Beschreibung

Teil A: Grundlagen

Planerische Rahmenbedingungen, Raumstrukturdaten und Netzwerke, Methodik und Verfahren, Empirische Verkehrsdaten für Verkehrsmodellentwicklungen, Verkehrserzeugung, Verkehrsverteilung, Verkehrsmittelwahl, Verkehrsumlegung, Stärken und Schwächen unterschiedlicher Modellansätze, Kalibrierung und Validierung, Prognosen- und Szenarioentwicklung

Teil B: Modellierung

Praktische Umsetzung und Anwendung, Modellierung eines Verkehrsnetzes und der Verkehrsnachfrage mit PTV VISUM, Praktische Anwendung der Theorie und kritische Betrachtung von Modellergebnissen, Präsentation der Studierenden in Gruppen

engl. Beschreibung/ Kurzkommentar

Part A: Principles

Transport planning framework, Methodology and procedures, Land-Use Data and networks, Empirical Travel Data for model developments, Trip generation, Trip distribution, Mode choice, Traffic assignment, Methods and algorithms, Strengths and weaknesses of different model approaches, Calibration and validation, Forecasting and scenario calculations

Part B: Model Development

Practical implementation and application, Modelling transport network and travel demand using PTV VISUM, Application of learned methodological approach(es) and critical reflection of the model outputs, Student presentation (group work)

Bemerkung

Beleg; Prüfungsvoraussetzung: Belegabgabe

Voraussetzungen

Teilnehmeranzahl auf 15 begrenzt. Bestätigung der Professur Verkehrssystemplanung notwendig

Bewerbung bis 09.10.2019 per Mail an vsp@bauing.uni-weimar.de. Bitte kurz den fachlichen Hintergrund und die Motivation für die Kursteilnahme schildern.

Empfohlen: Vorkenntnisse in der Modellierung/ Simulation u./o. Verkehrsplanung und-technik

Leistungsnachweis

Teil A:

Klausur (120 Min), Englisch, 50%

Teil B:

Beleg und Präsentation, Englisch, 50%

Die Belegabgabe ist Vorraussetzung für die Klausurteilnahme

417230000 Virtual Reality – Final Project

B. Fröhlich, A. Kulik, N.N., E. Schott, T. Weißker Veranst. SWS: 1
Independent Study

Beschreibung

Im Abschlussprojekt der Vorlesung „Virtual Reality" sollen die Teilnehmer die erlangten theoretischen und praktischen Fertigkeiten auf den Entwurf, die Implementierung und die Präsentation eines eigenständigen kleinen Forschungsprojektes anwenden. Dazu soll zunächst ein Projektkonzept entwickelt werden, welches dann mit einer 3D-Engine zu implementieren und abschließend in einem Vortrag zu präsentieren ist. Dies ist eine wertvolle Gelegenheit, mit der modernen VR-Hardware in unserem Lab (Head-Mounted Displays, Multi-User-Projektionssystemen oder Multi-Touch-Tabletops) an einer spannenden Fragestellung Ihrer Wahl zu arbeiten.

engl. Beschreibung/ Kurzkommentar

Virtual Reality – Final Project

This final project requires the participants to apply the obtained theoretical and practical skills of the course "Virtual Reality" in the design, implementation and presentation of an individual small research project. In particular, you will be asked to develop a concept, come up with an effective and efficient implementation in a 3D engine and present

your results in a concise talk. This is an invaluable opportunity to work on an interesting topic of your choice with the state-of-the-art VR-hardware available in our lab such as head-mounted displays, multi-user projection systems and multi-touch tabletops. i

Voraussetzungen

Erfolgreiche Teilnahme an der Veranstaltung „Virtual Reality"

Successful completion of the course „Virtual Reality"

Leistungsnachweis

Abschlusspräsentation

Final Presentation

417290000 Software Engineering (M.Sc.)

F. Echtler Veranst. SWS: 3
Vorlesung
Do, wöch., 13:30 - 15:00, Coudraystraße 13 B - Hörsaal 3, Lecture / Lab class, ab 17.10.2019
Di, Einzel, 13:00 - 15:00, Steubenstraße 6, Haus F - Hörsaal K20, Prüfung / Examination, 11.02.2020 - 11.02.2020

engl. Beschreibung/ Kurzkommentar

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

418260009 Java Programming

A. Jakoby, N. Lang Veranst. SWS: 3
Blockveranstaltung
Mo, wöch., 09:15 - 16:45, Bauhausstraße 11 - Pool-Raum 128, 16.03.2020 - 23.03.2020
Di, Einzel, 09:15 - 10:45, Bauhausstraße 11 - Pool-Raum 128, 17.03.2020 - 17.03.2020
Di, Einzel, 11:00 - 12:30, Bauhausstraße 11 - Seminarraum 015, 17.03.2020 - 17.03.2020
Di, Einzel, 12:30 - 16:45, Bauhausstraße 11 - Pool-Raum 128, 17.03.2020 - 17.03.2020
Mi, wöch., 09:15 - 16:45, Bauhausstraße 11 - Pool-Raum 128, 18.03.2020 - 25.03.2020
Do, wöch., 09:45 - 16:45, Bauhausstraße 11 - Pool-Raum 128, 19.03.2020 - 26.03.2020
Fr, wöch., 09:45 - 16:45, Bauhausstraße 11 - Pool-Raum 128, 20.03.2020 - 27.03.2020
Di, Einzel, 09:45 - 16:45, Bauhausstraße 11 - Pool-Raum 128, 24.03.2020 - 24.03.2020

Beschreibung

This block course gives students the possibility to learn Java from the very beginning. After giving and overview over the basic concepts such as variables, conditions, loops and object-oriented programming, we will have a closer look on some advanced concepts such as generics, software testing and GUI. Because many practical tasks have to be

solved, students are asked to bring their laptop if possible. The target group consists mainly of master's students who have just basic programming skills, who need to refresh their skills, or who are simply interested in learning Java. Throughout the course, students have to complete assignments. After the two-week-block, students have to solve one mini project. The final grade (only if you are eligible for ECTS, more info in the first session) will be based on the presentation of this mini project in combination with a short documentation (~3-10 pages).

engl. Beschreibung/ Kurzkommentar

This block seminar gives students the possibility to learn Java from the very beginning. In this context general concepts of programming will be tought such as: - variables - conditions - loops - methods - arrays and lists - strings - object-oriented programming - ... Because many practical tasks have to be solved, students are asked to bring their Laptop. If they cannot bring one with them, they should search for a partner having one to work with. The target group consists mainly of master's students who have just basic programming skills, who need to refresh their skills, or who are just interested in learning Java. After completing the block seminar, students have to solve one mini project. The final grade will be based on the presentation of this mini project in combination with a short documentation (~3-10 pages).

Leistungsnachweis

Miniprojekt

419240043 Real-time Rendering

R. Carmona Suju, S. Beck, A. Kreskowski Veranst. SWS: 3

Vorlesung

Mi, wöch., 11:00 - 12:30, Bauhausstraße 11 - Seminarraum 015, Lecture, ab 16.10.2019
Mo, wöch., 09:15 - 10:45, Bauhausstraße 11 - Pool-Raum 128, Group 1, ab 28.10.2019
Di, wöch., 09:15 - 10:45, Bauhausstraße 11 - Pool-Raum 128, Group 2, ab 29.10.2019
Do, Einzel, 10:00 - 12:00, Steubenstraße 6, Haus F - Hörsaal K20, Examination / Prüfung, 20.02.2020 - 20.02.2020

Beschreibung

Dozent: Prof. Rhadamés Carmona, PhD

Ziel dieser Vorlesung ist es, den Studierenden die theoretischen und angewandten Grundlagen für das Design und die Analyse effizienter Algorithmen für Probleme mit geometrischem Input und Output zu vermitteln. Der Kurs konzentriert sich auf Echtzeitprobleme in 2D- und 3D-Computergraphik- und Visualisierungsanwendungen.

Durch diese Vorlesung erlernen Studierende grundlegende und fortgeschrittene Algorithmen und Datenstrukturen zur Lösung konkreter Probleme auszuwählen, anzupassen und zu implementieren. Darüber hinaus sollen sie in der Lage sein, die Komplexität der Algorithmen und Datenstrukturen zu analysieren.

Die begleitenden Übungen vermitteln den Studierenden die notwendigen Fähigkeiten, um ausgewählte Algorithmen zu implementieren und zu testen.

Voraussetzungen

Decent programming skills needed.

Knowledge of C++ is helpful for the lab classes, but other programming languages might be used as well. Completion of course Algorithms and Datastructures or similar courses is an ideal prerequisite for successful participation.

Leistungsnachweis

Vorlesungsbegleitende, bewertete Übungen, mündliche oder schriftliche Prüfung. Ein abschließendes Projekt wird separat bewertet und erhält zusätzliche 1.5 ECTS.

419240044 Real-time Rendering - Final Project

R. Carmona Suju, S. Beck, A. Kreskowski Veranst. SWS: 1
Independent Study

Beschreibung

Dozent: Prof. Rhadamés Carmona, PhD

Im Abschlussprojekt der Vorlesung „Real-time Rendering" sollen die Teilnehmer die erlangten theoretischen und praktischen Fertigkeiten auf den Entwurf, die Implementierung und die Präsentation eines eigenständigen kleinen Forschungsprojektes anwenden. Dazu soll ein Problem ausgewählt, eine Lösung zu entwickelt, eine effiziente Implementierung realisiert und Ihre Ergebnisse abschließend in einem Vortrag präsentiert werden.

Dies ist eine wertvolle Gelegenheit, an einem interessanten Thema Ihrer Wahl im Bereich der geometrischen Algorithmen zu arbeiten.

Voraussetzungen

Erfolgreiche Teilnahme an der Vorlesung "Real-time Rendering"

Leistungsnachweis

Abschlusspräsentation

419240045 Photogrammetric Computer Vision - Final Project

V. Rodehorst, M. Kaisheva Veranst. SWS: 1
Independent Study

Voraussetzungen

Erfolgreiche Teilnahme an der Vorlesung " Photogrammetric Computer Vision"

Leistungsnachweis

Abschlusspräsentation

4526501 Academic English Part One

G. Atkinson Veranst. SWS: 2
Kurs
Mi, wöch., 17:00 - 18:30, Bauhausstraße 11 - Seminarraum 013, ab 06.11.2019
Mi, Einzel, 17:00 - 18:30, Bauhausstraße 11 - Seminarraum 015, Examination, 12.02.2020 - 12.02.2020

engl. Beschreibung/ Kurzkommentar

Academic English Part One

This is the first part of a two-part course which aims to improve your ability to express yourself clearly in written English and to develop a suitably coherent academic writing style. Part One concentrates mainly on structure in writing academic articles, essays and reports. We begin by examining the structure of individual paragraphs and move on to extended texts of various types (e.g. process essays, cause/effect, comparison/contrast, etc.). Particular attention is paid to connectives, i.e. transitional phrases and constructions which help you link ideas and paragraphs in a logical, systematic way.

Bemerkung

You are advised to take Part One first, although it is possible to take both parts concurrently (i.e. in the same semester) or in reverse order.

Voraussetzungen

Registration (compulsory)

All students must register. First time particpants are required to present the B2 English Level Certificate before the beginning of the course.

Howard Atkinson therefore offers the following consultation hours:

30. October 2019, 13:00-17:00 p.m., room 001, Bauhausstraße 11

Leistungsnachweis

written examination

4526502 Academic English Part Two

G. Atkinson Veranst. SWS: 2

Kurs

Do, wöch., 17:00 - 18:30, Bauhausstraße 11 - Seminarraum 015, ab 07.11.2019
Do, Einzel, 17:00 - 18:30, Bauhausstraße 11 - Seminarraum 015, Examination, 13.02.2020 - 13.02.2020

engl. Beschreibung/ Kurzkommentar

Academin English Part Two

Part Two of the Academic English course concentrates on improving and refining aspects of academic style. It includes sections on clause and sentence structure, punctuation rules and how to incorporate quotations, statistics and footnotes into academic texts. Students will be encouraged to bring along examples of their own written work, which the class can then correct and improve together in a constructive, mutually supportive atmosphere.

Bemerkung

You are advised to take Part One first, although it is possible to take both parts concurrently (i.e. in the same semester) or in reverse order.
If you wish to take Part Two first, it is necessary to take a placement test.

Voraussetzungen

Registration (compulsory)

All students must register. First time particpants are required to present the B2 English Level Certificate before the beginning of the course.

Howard Atkinson therefore offers the following consultation hours:

30. October 2019, 13:00-17:00 p.m., room 001, Bauhausstraße 11

Leistungsnachweis

written examination

Project

2302009 Evaluation, comparison and validation of the background oriented schlieren (BOS) technique

C. Völker, L. Becher Veranst. SWS: 8
Projekt

2303009 Open BIM Common Data Environment

C. Koch, M. Artus Veranst. SWS: 8
Projekt

2303010 Virtual Mechanics Lab

C. Koch, M. Artus Veranst. SWS: 8
Projekt

2451010 Digitalized Production of Mechanical Structures

T. Lahmer, S. Marwitz, Z. Jaouadi Veranst. SWS: 8
Projekt

Beschreibung

Optimisation and Sensitivity analysis studies the sensitivity of the model by how much and/or what will be the proportion (or role) of the input parameters (reduced set of important variables) that cause significant influence on the output of the model. In short, analysing the contribution of input parameters on the output variability of the model. Generally (mathematically), it is used to determine the effect on optimal solutions of changes in parameter values of the objective function. They are computationally in-depth in the application of high dimensional functions. Optimisation algorithm can greatly improve the dynamic performance of the control system. A model is designed for its effective usefulness, so that its outcome will be efficient. Identifying the parameters, analysing the model and applying various optimisation algorithms and sensitivity algorithms on a model for increase of its efficiency is the prime motto of the project. These algorithms can be applied in various fields such as engineering, medical, economics etc., Structuring the project tasks into analytical (mathematical formulation), parameterization, applying optimisation and sensitivity algorithms by using the sofware OptiSlang (Software for Optimisation and Sensitivity Analysis) will be work flow of the project. The analysis will be applied either on vertically inverted oscillating pendulum or on the control of spring-mass systems.

2907015 Additive manufacturing in civil engineering: Slicing supported by building information modeling

K. Smarsly, P. Peralta Abadía, J. Wagner Veranst. SWS: 8
Projekt

2909022 Mobility as a Service

U. Plank-Wiedenbeck, M. Fedior, J. Uhlmann Veranst. SWS: 8
Projekt
Mo, wöch., 09:15 - 10:45, Marienstraße 7 B - Student Design Studio – SDS 303, ab 21.10.2019

Beschreibung

Es werden aktuelle Fragestellungen aus dem Mobilitätsmanagement mit speziellem Fokus auf der Anwendung neuartiger Mobilitätsformen und -dienstleistungen behandelt. Für Beispielfälle, die aus der Realität abgeleitet sind, werden innovative und umweltfreundliche Lösungen erarbeitet. Das Projekt wird in Gruppenarbeit mit Studierenden aus unterschiedlichen Fachbereichen bearbeitet.

Weitere Informationen:

https://www.uni-weimar.de/en/civil-engineering/chairs/transport-system-planning/teaching/modules/master/project-mobility-as-a-service/

Bemerkung

Die Teilnehmerzahl ist auf 25 begrenzt.

Anfang des Semesters wird eine Informationsveranstaltung zum Projekt angeboten

- 16.10.2019, 13:30 Uhr
- Raum 305 (DG) Marienstr. 13C

Leistungsnachweis

2 Zwischenpräsentationen

1 Projektbericht mit finaler Präsentation und Poster

419210010 Augmented Writing Assistant Phase 2

B. Stein, K. Al Khatib, R. El Baff Veranst. SWS: 10
Projekt

engl. Beschreibung/ Kurzkommentar

"It's easy to forget that the words we choose can change how people react... and change the future". This project aims at developing a working prototype for an intelligent writing assistant tool. Blog writers, among others, can use the tool to attract various types of readers (sociable, sarcastic, etc.). Mainly, the tool will provide the writers with helpful suggestions (based on artificial intelligence-based strategies) in order to boost the content impact on the target readers. The project will concentrate on (1) developing an effective and easy to use GUI, and (2) integrating different related text mining approaches that the group already has successfully developed.

Bemerkung

Ort und Zeit werden zur Projektbörse bekannt gegeben.

Time and place will be announced at the project fair.

Voraussetzungen

Programming: Golang, Java, or Python. At least basic knowledge in WebApp development.

Leistungsnachweis

Abschlusspräsentation und Ausarbeitung

419210016 Green Configurator III - Optimizing energy consumption of complex systems

N. Siegmund, J. Dorn, M. Weber Veranst. SWS: 10
Projekt

Beschreibung

Reducing energy consumption of software and hardware systems becomes increasingly important. This project focuses on developing and implementing tools and technologies that help understanding and reducing energy consumption while guaranteeing the performance.

Students will use a fine grained energy measurement system that is able to provide accurate measurements for each hardware component of the Computer. Furthermore, they will measure and analyze energy and performance properties of realistic software and hardware setups. Finally, they will design and implement the 'Green Configurator', a tool that visualizes energy and performance models to the end user.

Bemerkung

Time and place will be announced at the project fair.

Voraussetzungen

Required competences:

- Soft skills (presenting, discussing, team work)

- Knowledge in software engineering

- Basic Python skills

- Self-reliant working

Leistungsnachweis

Final presentation and documentation

419210018 Hot Topics in Computer Vision WS19/20

V. Rodehorst, C. Benz, P. Debus, M. Kaisheva 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/ Kurzkommentar

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

419210021 Modelling verbal aggression in social discourse

B. Stein, K. Al Khatib, R. El Baff, M. Wolska Veranst. SWS: 10
Projekt

engl. Beschreibung/ Kurzkommentar

"Hate speech" is, roughly speaking, a type of prejudiced and/or discriminatory verbal communication which expresses aggressiveness toward a group or class of people. The broader phenomenon of verbal aggression includes other forms of violent verbal (and non-verbal) communication such as, for instance, swearing, verbal abuse, contempt, ridicule, or threats. In this project, we will investigate acts of verbal aggression based on a corpus of posts to Gab, a controversial social media site which promotes "free speech, individual liberty and the free flow of information online" while tolerating aggressive verbal behavior. We will categorize acts of verbal aggression drawing on existing typologies and, if time allows, build classifiers to identify (and classify) verbal aggression in social discourse. Ultimately, we are interested in questions such as: What is "hate speech" exactly? What is "hate speech" already and what isn't yet? What do people "hate" and how do they express it?

Bemerkung

Ort und Zeit werden zur Projektbörse bekannt gegeben.

Time and place will be announced at the project fair.

Leistungsnachweis

Abschlusspräsentation und Ausarbeitung

419210031 Word Embeddings with pyTorch

B. Stein, T. Gollub, M. Völske Veranst. SWS: 10
Projekt

engl. Beschreibung/ Kurzkommentar

In the project, we implement neural networks for the training of word embeddings with pyTorch as well as an evaluation program for measuring the performance of word embeddings in various NLP applications. In particular, we study to which extent biases in text corpora can be assessed with the help of word embeddings.

Bemerkung

Ort und Zeit werden zur Projektbörse bekannt gegeben.

Time and place will be announced at the project fair.

Leistungsnachweis

Abschlusspräsentation und Ausarbeitung

419210035 Construction of new pre-conditioners for the solution of linear algebraic systems

K. Gürlebeck, A. Legatiuk, D. Legatiuk Veranst. SWS: 10
Projekt

Beschreibung

Almost all discretization methods for boundary value problems lead at the end to the solution of huge linear algebraic systems. One of the main problems in practise (also in commercial software solutions) is that the condition number of the matrix of the system is growing rapidly and the numerical solution of the system goes wrong or is not accurate enough. A common strategy to overcome this problem is to multiply the system by a certain matrix, the so-called preconditioner, such that the product shows a better behaviour of the condition number than the original matrix. The main goal of the project is to implement some new strategies in MATLAB. The properties of the new preconditioners must be studied, based on a series of numerical situations. Comparisons with existing methods will be performed.

Bemerkung

Time and place will be announced on teh project fair/ Zeit und Ort werden zur Projektbörse bekannt gegegben.

419210036 Neural Bauhaus Style Transfer

C. Benz Veranst. SWS: 10
Projekt

Beschreibung

Whereas typical deep learning models only have discriminative capabilities -- basically classifying or regressing images or pixels -- generative adversarial networks (GANs) [1] are capable of generating, i.e. producing or synthesizing new images. A whole movement has emerged around the CycleGAN [2,3] approach, which tries to apply the style of one image set (say the paintings of Van Gogh) onto another (say landscape photographs). The applicability of this approach for the transfer of Bauhaus style onto objects or buildings in images or whole images should be explored. At the end of the project a minor exploration on a seemingly different, but well-related problem takes place: In how far is the obtained GAN capable of augmenting a dataset of structural defect data.

References:

[1] *Goodfellow, Ian, et al. "Generative adversarial nets." Advances in neural information processing systems. 2014.*

[2] *Zhu, Jun-Yan, et al. "Unpaired image-to-image translation using cycle-consistent adversarial networks." Proceedings of the IEEE international conference on computer vision. 2017.*

[3] *https://junyanz.github.io/CycleGAN/*

Bemerkung

Time and place will be announced on the project fair/ Zeit und Ort werden zur Projektbörse bekannt gegeben.