

Vorlesungsverzeichnis

M.Sc. Human-Computer Interaction (ab PV19)

WiSe 2024/25

Stand 22.10.2024

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M.Sc. Human-Computer Interaction (ab PV19)**Faculty Welcome for Master's Students Human-Computer Interaction**

Monday, 14th October 2024, 10 a.m., Bauhausstraße 11, seminar room **A**

Project fair

Monday, 14th October 2024, 5 p.m., Steubenstraße 6, Audimax

Theses-Seminar HCI

E. Hornecker

Seminar

Di, Einzel, 09:00 - 17:00, Karl-Haußknecht-Straße 7 - Hörsaal (IT-AP), 01.10.2024 - 01.10.2024

Beschreibung

Vorträge zu aktuellen Dissertationen und Veröffentlichungen sowie laufenden Master- und Bachelorarbeiten werden im Rahmen des Seminars präsentiert und diskutiert.

Bemerkung

Für diese Veranstaltung werden keine ECTS-Punkte vergeben.

HCI Fundamentals**Concepts & Methods**

4556216 Ubiquitous Computing

E. Hornecker, R. Koningsbruggen, M. Osipova, H.

Veranst. SWS: 4

Waldschütz

Vorlesung

Di, wöch., 13:30 - 15:00, Karl-Haußknecht-Straße 7 - Hörsaal (IT-AP), Lab class / first lecture (October 11th, 2022) , ab 15.10.2024

Mo, wöch., 13:30 - 15:00, Karl-Haußknecht-Straße 7 - Hörsaal (IT-AP), Lecture, ab 21.10.2024

Beschreibung

The course covers the research area and technology field of Ubiquitous Computing (UbiComp). UbiComp technologies move beyond 'traditional' computing concerns, moving from the desktop into the world, from the workplace to the home and other settings [e.g., domestic, public spaces], from purely functional to ludic concerns [e.g. home entertainment, pervasive games], and from digital to digital-physical systems [tangible computing, IoT].

The course covers technical aspects as well as design issues, and addresses user-centered design, concept prototyping and evaluation methods relevant for Ubiquitous Computing. It includes discussion of broader societal and

value-related concerns (e.g. privacy, security, user agency versus ambient intelligence). We will discuss and reflect on concerns, perspectives and the interdisciplinary nature of UbiComp.

Successful students should be able to

- discuss the diverse and emergent areas within UbiComp technologies and the issues entailed
- develop concepts for UbiComp applications that are appropriate for a given use context and illustrate these (sketching, video prototyping, Wizard of Oz) as well as determine their technical feasibility
- be able to reflect on practical experiences engaging with some of these technologies from a user-centred perspective
- understand the technical functioning of example UbiComp technologies
- choose and provide a rationale for appropriate user-centered design methods for exemplary application problems
- critically assess societal implications and discuss design trade-offs of UbiComp applications.
- Critically reflect on technology visions
- understand complex issues from the HCI and UbiComp research literature, in particular, to summarize literature and to discuss it

Bemerkung

Note: This course is offered biannually

Leistungsnachweis

practical problem-based coursework, mostly done in group work. Final individual project-based report.

Psychology

424220003 Human factors: Basics of perception and cognition

J. Ehlers

Veranst. SWS: 3

Vorlesung

Di, wöch., 11:00 - 12:30, Karl-Haußknecht-Straße 7 - Seminarraum (IT-AP) 001, ab 15.10.2024

Beschreibung

How is our thinking organised? Do we all perceive the world in the same way? What directs our attention? The lecture provides an overview of the most important theories, findings and methods of cognitive psychology. Emphasis will be placed on visual information processing as well as on attention and memory models relevant to human-computer interaction. By the end of the semester, students should have acquired an understanding of the mechanisms of human cognition and be able to apply them to the design of good interaction designs. The course includes exercises with practical examples as well as guided data collection.

Leistungsnachweis

Practical exercises and written exam

HCI Specialisation

Specialisation HCI

424220003 Human factors: Basics of perception and cognition

J. Ehlers

Veranst. SWS: 3

Vorlesung

Di, wöch., 11:00 - 12:30, Karl-Haußknecht-Straße 7 - Seminarraum (IT-AP) 001, ab 15.10.2024

Beschreibung

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Leistungsnachweis

Practical exercises and written exam

4556216 Ubiquitous Computing

E. Hornecker, R. Koningsbruggen, M. Osipova, H.

Veranst. SWS: 4

Waldschütz

Vorlesung

Di, wöch., 13:30 - 15:00, Karl-Haußknecht-Straße 7 - Hörsaal (IT-AP), Lab class / first lecture (October 11th, 2022) , ab 15.10.2024

Mo, wöch., 13:30 - 15:00, Karl-Haußknecht-Straße 7 - Hörsaal (IT-AP), Lecture, ab 21.10.2024

Beschreibung

The course covers the research area and technology field of Ubiquitous Computing (UbiComp). UbiComp technologies move beyond 'traditional' computing concerns, moving from the desktop into the world, from the workplace to the home and other settings [e.g., domestic, public spaces], from purely functional to ludic concerns [e.g. home entertainment, pervasive games], and from digital to digital-physical systems [tangible computing, IoT].

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Bemerkung

Note: This course is offered biannually

Leistungsnachweis

practical problem-based coursework, mostly done in group work. Final individual project-based report.

Specialisation Tech

424220000 Methods of Social Data Analysis

M. Jakesch

Veranst. SWS: 4

Vorlesung

Di, wöch., 15:15 - 16:45, Bauhausstraße 11 - R 015, Lecture / Übung, ab 22.10.2024

Mi, wöch., 11:00 - 12:30, Bauhausstraße 9a - Linux-Pool, Reservation only, ab 23.10.2024

Mi, wöch., 11:00 - 12:30, Bauhausstraße 11 - Pool G, Lab class / Übung, ab 23.10.2024

Beschreibung

Digital platforms and devices have become part of our daily lives, enabling us to collect data about human behavior on a scale unimaginable before. The analysis of social data offers new approaches to questions about human behavior and promises insights for business and politics. However, social data analysis is fraught with

analytical pitfalls. The downside of large, rich datasets is information overload, complicating the search for a viable approach. Analyzing data collected for different purposes in complex environments also easily leads to false conclusions. This course tries to equip students with basic skills for diving in social data. In a series of lectures, paper discussions, and hands-on project exercises, we will transform, describe, and make inferences about numeric, textual, and relational social data. We will also consider the ethics of social data analysis and its opportunities for social science more generally.

Voraussetzungen

Students will be asked to submit a course project proposal after the second class, based on which final admittance will be determined.

Leistungsnachweis

Individual presentations, course project in small groups, final exam.

4556228 Virtual Reality

B. Fröhlich, K. Brehm, E. Schott, T. Zöppig

Veranst. SWS: 4

Vorlesung

Do, wöch., 13:30 - 15:00, Bauhausstraße 11 - R 015, Lecture, ab 17.10.2024

Fr, wöch., 09:15 - 10:45, Übung Gruppe A VR-Lab, R.N104, B11, ab 18.10.2024

Fr, wöch., 11:00 - 12:30, Übung Gruppe B VR-Lab, R.N204, B11, ab 18.10.2024

Beschreibung

Virtual Reality (VR) erfreut sich seit mehreren Jahren großer Beliebtheit in Forschung, Unterhaltung und Bildung. VR-Systeme ermöglichen die Interaktion einer oder mehrerer Benutzer*innen mit einer computersimulierten Umgebung, welche dreidimensional auf einem stereoskopischen Display dargestellt wird. In dieser Veranstaltung lernen Sie die theoretischen, technischen und angewandten Grundlagen moderner Virtual Reality-Systeme genauer kennen.

Die Vorlesung beginnt mit den Grundlagen der Computergrafik und des stereoskopischen Sehens, welche zur Realisierung von VR-Anwendungen erforderlich sind. Danach werden Sie verschiedene 3D-Eingabegeräte und 3D-Interaktionstechniken wie Selektion, Manipulation und Navigation in virtuellen Umgebungen kennenlernen. Der letzte Teil des Kurses baut auf dem bereits erworbenen Wissen auf und konzentriert sich auf kollaborative VR-Systeme für mehrere am gleichen oder an verschiedenen Orten befindliche Benutzer*innen.

Die Vorlesung wird von Laborveranstaltungen begleitet, welche neueste Virtual Reality-Technologien wie Multi-Viewer-3D-Projektionssysteme und hochauflösende Head-Mounted Displays einsetzen. Im Rahmen der Übungsaufgaben werden Sie verschiedene 3D-Interaktionstechniken für diese immersiven Displays sowie unter Nutzung von räumlichen Trackingsystemen und 3D-Eingabegeräten implementieren und auswerten. Je nach Situation können Sie auch von zu Hause aus an den Übungen arbeiten.

Wir planen, ausgewählte Vorlesungen und Übungen direkt in virtueller Realität durchzuführen, um das Konzept „Teaching VR in VR“ zu testen. Dazu werden wir nach Möglichkeit alle Teilnehmer*innen mit HMDs ausstatten.

Bemerkung

Digital Engineering or MediaArchitecture students may also attend this lecture if they have already acquired the necessary programming skills through successful completion of appropriate courses and are able to demonstrate their skills at the beginning of the lab course. If you are interested in attending this course, please contact Prof. Fröhlich or one of his staff members named above.

Voraussetzungen

Basic knowledge of computer graphics is recommended. Fundamental programming skills are required.

Digital Engineering or MediaArchitecture students may also attend this lecture if they have already acquired the necessary programming skills through successful completion of appropriate courses and are able to demonstrate their programming skills at the beginning of the lab course. If you are interested in attending this course, please contact Prof. Fröhlich or one of his teaching assistants named above.

Leistungsnachweis

Vorlesungsbegleitende, bewertete Übungen, mündliche Prüfung und ein abschließendes Projekt.

904003/ 439100 Raumbezogene Informationssysteme/ Spatial information systems (GIS)

T. Gebhardt, V. Rodehorst

Veranst. SWS: 4

Integrierte Vorlesung

Fr, wöch., 13:30 - 15:00, Marienstraße 13 C - Hörsaal A, Übungen, ab 25.10.2024

Mi, wöch., 09:15 - 10:45, Marienstraße 13 C - Hörsaal A, Vorlesungen

Beschreibung

Die Vorlesung vermittelt vertiefte Grundlagen raumbezogener Informationssysteme, wie z.B. die Aufnahme, Organisation, Analyse und Präsentation raumbezogener Daten. Die Themen umfassen geographische Daten und frei verfügbare Ressourcen, Referenzsysteme und Kartennetzentwürfe, Geo-Datenbanken und effiziente Datenstrukturen, geometrische und topologische Datenanalyse, kartographische Generalisierung und Visualisierung sowie GIS im Planungskontext.

Bemerkung

Für die Selbsteinschreibung in den zugehörigen MOODLE-Lernraum (Hyperlink siehe oben!) lautet das Passwort: **spatial24**

Leistungsnachweis

Erfolgreiche Bearbeitung der Übungen und des Projektes mit abschließender Klausur

HCI Technologies**Computer Vision**

904003/ 439100 **Raumbezogene Informationssysteme/ Spatial information systems (GIS)**

T. Gebhardt, V. Rodehorst

Veranst. SWS: 4

Integrierte Vorlesung

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Visual Interfaces

4556228 **Virtual Reality**

B. Fröhlich, K. Brehm, E. Schott, T. Zöppig

Veranst. SWS: 4

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Leistungsnachweis

Vorlesungsbegleitende, bewertete Übungen, mündliche Prüfung und ein abschließendes Projekt.

Design Theory

324230019 Digital Culture in Design, Media and Architecture (Part 1)

J. Willmann, M. Braun, KuG

Veranst. SWS: 2

Wissenschaftsmodul

Mo, Einzel, 13:30 - 15:00, Geschwister-Scholl-Str. 7 - 116, Introductory event, 21.10.2024 - 21.10.2024

Mo, wöch., 13:30 - 15:00, Geschwister-Scholl-Str. 7 - 116, Lecture, 28.10.2024 - 03.02.2025

Mo, wöch., 15:15 - 16:45, Geschwister-Scholl-Str. 7 - 116, Exercise, 04.11.2024 - 03.02.2025

Beschreibung

Die Veranstaltung findet auf Englisch statt. Über die Sprachumschaltflagge (oben rechts) gelangen Sie zur englischsprachigen Beschreibung.

Bemerkung

Bitte beachten Sie die entsprechende Studienordnung.

Research Project 1

424210001 Argumentative AI for Images and Texts

T. Gollub, K. Heinrich

Projekt

Beschreibung

Arguments are increasingly communicated with images, especially in social media through memes.

In this project, we want to explore methods of how images can be retrieved or generated with AI to enhance the impact of arguments. We also want to investigate how such argumentative images can be automatically categorized and how they interact with other social media content.

Bemerkung

Zeit und Ort werden zu Projektbörse bekannt gegeben!
The time and place will be announced at the project fair!

Leistungsnachweis

Abschlusspräsentation und Ausarbeitung

424210002 Digital Dreams II

C. Wüthrich, W. Kissel, G. Pandolfo

Veranst. SWS: 10

Projekt

Beschreibung

Herzlich willkommen bei Digital Dreams | Bauhaus Gamesfabrik, einem spannenden interdisziplinären Projekt, das die Fakultäten Kunst & Gestaltung und Medien an unserer Universität zusammenbringt. In diesem innovativen Projekt arbeiten Studierende unterschiedlicher Fachrichtungen in interdisziplinären Gruppen zusammen, um die dynamische Welt der Spieleentwicklung zu erkunden.

An der Schnittstelle von Kunst und Technologie dient Digital Dreams | Bauhaus Gamesfabrik als Spielwiese für Kreativität und Innovation. Studierende der Fakultät Kunst & Gestaltung bringen ihre Expertise in visueller Ästhetik, Erzählkunst und Konzeption ein, während diejenigen der Fakultät Medien ihre Fähigkeiten in Programmierung, Animation und interaktiven Medien einbringen.

In diesem gemeinschaftlichen Unterfangen werden interdisziplinäre Gruppen gebildet, die einen reichen Ideen- und Perspektivenaustausch fördern. Inspiriert vom Pioniergeist der Bauhaus-Bewegung, wo Kunst und Technologie zusammenkamen, um das moderne Design zu prägen, begeben sich unsere Studierenden auf eine Reise, um immersive und fesselnde Spielerlebnisse zu gestalten.

Im Laufe des Projekts vertiefen sich die Studierenden in verschiedene Aspekte der Spieleentwicklung, von der Ideenfindung und Prototypenerstellung bis hin zur Produktion und Präsentation. Unter der Anleitung eines erfahrenen Mentors beider Fakultäten lernen sie, die Komplexität interdisziplinärer Teamarbeit zu bewältigen und ihre einzigartigen Stärken zu nutzen, um Herausforderungen zu meistern und ihre kreative Vision zu verwirklichen.

Digital Dreams | Bauhaus Gamesfabrik ist mehr als nur ein Kurs; es ist eine transformative Erfahrung, die Studierenden ermöglicht, die Grenzen des traditionellen Spieldesigns zu überschreiten. Indem sie die Zusammenarbeit fördern und den Geist des Experimentierens annehmen, sind unsere Studierenden bereit, die nächste Generation visionärer Spieleentwickler zu werden und die Zukunft interaktiver Unterhaltung mitzugestalten.

Begleiten Sie uns auf dieser aufregenden Reise, auf der digitale Träume Wirklichkeit werden, und lassen Sie uns gemeinsam die Zukunft des Spielens an der Schnittstelle von Kunst und Technologie gestalten.

Bemerkung

Ort und Zeit werden zur Projektbörse bekanntgegeben.

Voraussetzungen

Studierende der Medieninformatik sollten Programmierkenntnisse mitbringen.

Studierende der Medienwissenschaft ein grundlegendes Interesse für Storytelling / Game Design

Leistungsnachweis

Abschlusspräsentation, fertiges Spiel.

424210004 Bobby Tables

S. Lucks, N. Lang, J. Leuther

Projekt

Beschreibung

Um zu verstehen, wie man ein sicheres System erstellt, fangen wir damit an, absichtlich ein unsicheres System zu bauen. Inspiriert von OWASP's Juice Shop (<https://help.owasp-juice.shop/>) ist unser Ziel, eine Plattform zu entwickeln, auf der Personen ihre Pentesting-Fähigkeiten üben können. Ausgehend vom Konzept des berühmten XKCD-Comics „Exploits of a Mom“ (<https://xkcd.com/327/>) möchten wir eine Plattform in einem Schulumfeld gestalten.

Voraussetzungen

At least one of the following:

- very good programming skills
- passed Webtechnologie
- passed Software Engineering
- passed Einführung in die Programmierung

Leistungsnachweis

Zwischenpräsentationen, Abschlusspräsentation, Abschlussbericht

424210005 Crush-testing Icons and Glyphs: how small can they get?

B. Fröhlich, D. Kiesel, I. López García

Projekt

Beschreibung

Icons und Glyphen sind gern genutzte Konzepte um kompakt multi-variate Daten darzustellen; sei es um Informationen auf einer Karte zu verorten, verschiedene Arten in einer Biodiversitätsstudie zu repräsentieren oder geloggte Interaktionssequenzen zu untersuchen. Typischerweise sind Glyphen eher klein, und ihre Größe kann verwendet werden, um geordnete Daten zu kodieren. Wie klein jedoch können die Glyphen eines Sets skaliert werden bevor einzelne Glyphen nicht mehr unterscheidbar sind? Können wir eine Metrik entwickeln, um vorherzusagen, ob die Glyphen in einem Glyphensatz bei kleinen Größen noch unterscheidbar bleiben?

Das Projekt wird sich mit diesen Fragestellungen beschäftigen. Dazu werden wir zunächst den Designspace von Glyphen erkunden, Glyphen typisieren, die existierende Literatur zur Skalierbarkeit von Glyphen (und verwandten Konzepten) analysieren und uns schließlich mit Hilfe einer Nutzerstudie Referenzwerte zur Glyphenähnlichkeit ermitteln. Auf Basis dieses Wissens werden wir Fehler-Typen in klein-skalierten Glyphen identifizieren und daraus Design-Guidelines und Mechanismen zur idealerweise automatischen Überprüfung der Unterscheidbarkeit von Glyphen entwickeln.

Voraussetzungen

Programming skills in Javascript. A completed Visualization course.

Leistungsnachweis

active participation during the project meetings; presentation of read literature; design, implementation and conduction of a user study; intermediate and final project presentation; final report.

424210006 Der Writer's Room - Kollaboratives Drehbuchsreiben mit KI

M. Gohsen, N. Mirzakhmedova

Projekt

Beschreibung

The essence of a great movie is its equally great script.

Writing a compelling script involves developing interesting characters, an exciting plot and convincing dialog. Although large language models (LLMs) have proven their potential to support these creative writing tasks, the generated texts usually lack depth and inventiveness.

This project aims to address these issues through human-AI collaboration and explore creative solutions to support screenwriting with LLMs. As part of this interdisciplinary project, you will learn how to write scripts, explore LLMs for their creative writing skills, and work closely with art and design students who will provide examples and feedback.

Bemerkung

Zeit und Ort werden zu Projektbörse bekannt gegeben!
The time and place will be announced at the project fair!

Voraussetzungen

- Passed one of the following courses: "Introduction to Machine Learning", "Introduction to Natural Language Processing" or "Softwareengineering II"
- Good programming skills
- Interested in creative writing

424210007 Distributed Wireless Sensor Systems and Applications

J. Ringert, B. Burse

Projekt

Beschreibung

We will develop low-cost distributed sensor nodes and apply them in a case study setting. The measured sensor data will be stored and made available for different analysis scenarios, e.g., exploring augmented building information models (BIMs).

engl. Beschreibung/ Kurzkomentar

Zeit und Ort werden zu Projektbörse bekannt gegeben!
The time and place will be announced at the project fair!

Voraussetzungen

Digital Engineering students must have completed their foundations.

Leistungsnachweis

Projektbericht und Ergebnisse in Form von Software.

424210008 Duplex Deep Dive

S. Lucks, N. Lang, J. Leuther

Projekt

Beschreibung

The „Duplex Mode“ is an increasingly popular construction used in modern symmetric cryptography algorithms. One example is the authenticated encryption mode of the recent ASCON standard for Lightweight Cryptography (<https://www.nist.gov/news-events/news/2023/02/nistselects-lightweight-cryptography-algorithms-protectsmall-devices>).

The project idea is to consider new variants of the Duplex mode, which, if secure, could provide some practical benefits. Students shall challenge the security of those variants, both discovering attacks, if possible, and by searching for ideas for security proofs.

This project resembles the everyday activities of a researcher in the field and offers a good introduction into proper scientific work. Depending on the results, the objective for the students is to share their findings in form of a research paper which will be submitted to an international conference. If the paper is accepted, we can fund a student to travel to the conference and to present the paper.

This project pairs well with the Seminar „Current Topics in Cryptography: Authenticated Encryption“ or with the lecture „Secure Channels“.

Voraussetzungen

- Introduction to Modern Cryptography (or equivalent)
- Interest in scientific work

Leistungsnachweis

Zwischenpräsentationen, Abschlusspräsentation, Abschlussbericht

424210009 Efficient Gaussian Splatting for Virtual Reality Applications

B. Fröhlich, A. Kreskowski, G. Rendle, S. Schneegans

Projekt

Beschreibung

Novel-view synthesis techniques based on Neural Radiance Fields [[Mildenhall et al. 2020](#)], Plenoxels [[Fridovich-Keil et al. 2022](#)], or, most recently and possibly most-well known, 3D Gaussian Splatting [[Kerbl et al. 2023](#), [Liu et al. 2024](#)] enable the visually high-fidelity reconstruction of surfaces which are hard or even near-impossible to reconstruct using classic photogrammetric approaches. Examples of such surfaces include fur, vegetation, transparent or translucent objects and thin structures in general. The novel-view synthesis approaches perform faithful interpolation of existing color information contained in a set of high-quality input images. Novel views can be rendered in real-time, provided one has access to powerful graphics hardware.

First research [[Lin et al. 2024](#)] has emerged which aims at reducing the rendering workload of weaker mobile devices using foveated rendering techniques. However, to enable the exploration of high-quality datasets in virtual reality applications, it is necessary to design rendering algorithms with e.g. output-sensitivity in mind. In the first part of this project, we will explore existing rendering and acceleration techniques for novel-view synthesis by example of **3D Gaussian Splatting**. After a detailed analysis of the rendering algorithms, we will design, implement and evaluate our own acceleration techniques for enabling real-time 3D Gaussian Splatting at high visual fidelity for state-of-the-art virtual reality devices.

In order to optimize performance for real-world datasets in virtual reality applications, we plan to explore an ocean floor dataset in virtual reality using head-mounted displays. The dataset will be captured and provided to us by the [MARUM - Center for Marine Environmental Sciences](#) at the beginning of our project.

If you are experienced or interested in real-time computer graphics and virtual reality, we would be excited to welcome you in our project. We will provide you with a Quest 3 for the duration of the project and together we will get our feet wet with our challenging real-world dataset and Efficient Gaussian Splatting for Virtual Reality!

Voraussetzungen

Solid software programming skills in C++ and a successfully completed computer graphics course or equivalent qualifications. Experience with GPGPU programming or algorithm design is helpful, but not required.

Leistungsnachweis

Active participation during the project meetings; design, implementation and evaluation of algorithms designed throughout the project; intermediate and final project presentations; final project report

424210012 Samples of One: Exploring Personal Data through Autobiographical Design and Auto-Ethnography

E. Hornecker, R. Koningsbruggen

Projekt

Beschreibung

Our personal lives are increasingly datafied, with aspects that previously did not exist numerically being counted and used to make predictions on how we can live *"happier, fitter, and better"* lives [1]. Using quantification to flatten complex topics, and present them in attractive and easy to read visualizations, these data present themselves as clean, neutral, objective, and standardized.

The results are personal data that lack personality. The data do not reflect us nor how we experienced them. For example, when communicating how sleepy we are, saying 'I am 5 sleepy' does not make much sense.

Therefore, this project explores how we can represent data in a more embodied and personal way through *dynamic data physicalisations*: physical artefacts that represent data through a change in their appearance.

To do so, we will draw on feminist, queer, intersectional, and more-than-human theories. Specifically, we will be looking into autobiographical design and auto-ethnography. Each student will be making their own, personal data physicalisation, live with this artefact, and conduct an auto-ethnographic study during this period.

This project will challenge you to explore what personal data are, how they align and differ from common data perceptions, and how to design for our new perceptions of personal data. Moreover, this project will introduce and give you experience with "auto-methods" (methods where you are your own user/target group).

This course is suited for students who like to be challenged to find problems, and who enjoy individual work and to come up with their own concepts. Students will focus on research topics such as "qualitative data representations", "data physicalisations", "data feminism", "showroom research", "critical design", and "speculative design". We encourage students to participate that have a high interest in working from theory, coming up with speculative concepts, and learn how to realise those concepts as an artefact. The project is most suited for students who want 18 ECTS.

1. Chris Elsdon, Mark Selby, Abigail Durrant, and David Kirk. 2016. Fitter, happier, more productive. *Interactions* 23, 5: 45–45. <https://doi.org/10.1145/2975388>

2. Yanni Alexander Loukissas. 2019. *All data are local: thinking critically in a data-driven society*. MIT Press, London.

Bemerkung

Zeit und Ort werden zu Projektbörse bekannt gegeben!
The time and place will be announced at the project fair!

Voraussetzungen

All participants should enjoy working in an interdisciplinary group, want to be creative, build prototypes, and be able to converse in English.

PD and MA: Please register until 16.10.2024 by sending an email to eva.hornecker@uni-weimar.de and rosa.donna.van.koningsbruggen@uni-weimar.de (please include a description of your prior experience in relevant areas or a portfolio).

424210013 Social Engineering – das Abenteuer geht weiter! II

A. Jakoby, S. Lucks, J. Ehlers, R. Adejoh, G. Pandolfo
Projekt

Beschreibung

Viele Cyber-Angriffe basieren auf Techniken des Social Engineering. Dazu gehören das Vortäuschen von Autorität, das Schreiben von Phishing-Mails, „Dumpster-Diving“ (das Durchsuchen von Abfällen nach nützlichen Informationen, die aus Leichtsinn weggeworfen wurden),

usw.

Social Engineering nutzt menschliche Charakterzüge aus, zum Beispiel den Respekt für Autorität, die Bereitschaft anderen zu helfen, aber auch Leichtgläubigkeit und Faulheit. Ebenso setzt Social Engineering auf das Auslösen und Ausnutzen von menschlichen Emotionen, z.B. Furcht, Neugier, Hoffnung oder Schuldgefühle.

In dem Projekt geht es darum, Techniken des Social Engineering zunächst zu beschreiben und zu verstehen und nachfolgend ein (Computer-)spiel daraus zu entwickeln.

Der Spieler bzw. die Spielerin soll sich in eine Organisation „einhacken“. Dazu muss er oder sie nach und nach verschiedene Zugangsdaten in Erfahrung bringen und in verschiedene IT-Systeme einbrechen – natürlich unter Anwendung immer anderer Techniken des Social Engineering.

Das Spiel soll zunächst einmal als Text-Adventure gespielt werden. Bei einem erfolgreichen Projektverlauf könnte ein Folgeprojekt das Spiel zu einem graphischen Abenteuerspiel weiterentwickeln.

Leistungsnachweis

Zwischenpräsentationen, Abschlusspräsentation, Abschlussbericht

424210014 Software Engineering for Autonomous Vehicles

J. Ringert, .. Soaibuzzaman

Projekt

Beschreibung

We will develop software to control autonomous vehicles. The physical vehicle will be equipped with a range of sensors, e.g., LiDAR, cameras, gyroscopes, and distance sensors.

We will use industry strength software platforms like the Robot Operating System (ROS2).

Bemerkung

Zeit und Ort werden zu Projektbörse bekannt gegeben!

The time and place will be announced at the project fair!

Voraussetzungen

Digital Engineering students must have completed their foundations.

Leistungsnachweis

Projektbericht und Ergebnisse in Form von Software.

424210015 With a little help of... Exploring and Critically Reflecting Generative AI Tools in Design Ideation Processes

E. Hornecker, H. Waldschütz

Projekt

Beschreibung

Much has changed in the recent past: the creation of all kinds of creative content no longer seems to be the exclusive domain of humans. AI can help us ideate and create many types of output. But even though it can produce stunning results, they need to be curated, modified and adjusted to distinguish them from arbitrary results that lack motivation or personal touch.

In this course we'll explore and reflect on the role and impact of generative AI tools in creative ideation processes in interaction design, in particular large language models and image generation models. We will explore how we can use these technologies to complement and enhance our own creative processes, but also reflect on their

limitations and how they can influence and even limit our own creativity. We will try to apply some structure to this computer-assisted creativity to see if we can achieve less arbitrary, more original results. The course takes a hands-on approach to collaborative human-machine interaction and encourages critical reflection on the implications of using AI in creative endeavours. We will also take some of the ideas and prototype them.

Following a Research through Design (RtD) approach, we will work in small groups to conduct our research and develop some of the ideas, for example using prototyping technology such as *Arduino*, *Processing* and others. We will look at the literature in this area of research, investigate creative processes and develop ideas/concepts.

This course is perfect for students who want to be challenged to find problems, who enjoy individual and (multidisciplinary) group work, and who want to develop their own concepts.

Bemerkung

Zeit und Ort werden zu Projektbörse bekannt gegeben!
The time and place will be announced at the project fair!

Leistungsnachweis

Active participation and interim presentations, (practical) problem-based work (both individual and in groups), and a project-based (scientific) report.

424210016 Hot Topics in Computer Vision WiSe24/25

V. Rodehorst, C. Benz, J. Eick, A. Frolov, M. Kaisheva
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.

Bemerkung

Ort und Zeit werden zur Projektbörse bekanntgegeben.

Voraussetzungen

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

Leistungsnachweis

Aktive Mitarbeit, Einführungsvortrag, Abschlusspräsentation, Dokumentation

424210017 UX4UX: Designing a Web-Based Digital Tool for UX Experts

E. Hornecker, N.N., M. Osipova
Projekt

Beschreibung

The project UX4UX is offered in collaboration with Preetha Moorthy – UX expert and researcher. In this project we will be collaboratively designing a prototype of a web-based tool for visualizing usability attributes and recommended methods for the evaluation of wearable devices and companion mobile health applications.

This project gives you an opportunity to learn and put in practice design and prototyping skills under the supervision of Margarita and Preetha. The resulting prototype will be the first step towards a real product. The work will be done both individually and in teams.

We expect through this project active participation and interim presentations, practical problem-based work (both individual and in groups), and a project-based report.

The project's active phase runs till the end of March and the expected workload is approximately 2 working days per week for 12 ECTs and 3 working days for 18 ECTs.

We encourage all students to email Margarita with your CV to check whether you qualify for the project. Please feel free to reach out for more details or with any questions or clarifications to be sure that this project is a good fit for you.

margarita.osipova@uni-weimar.de

Bemerkung

In this project we also have the participation of MSc. Preetha Moorthy.

Zeit und Ort werden zu Projektbörse bekannt gegeben!
The time and place will be announced at the project fair!

Voraussetzungen

Students from HCI Masters: have successfully completed at least one of the following courses by HCI chair: "HCI Introductions", "HCI Research Methods", "Ubiquitous Computing".

Students from CS4DM Masters: have successfully completed at least one of the following courses by HCI chair: "HCI Introduction", "HCI Research Methods", "Ubiquitous Computing".

Completed "Data Visualization" course would be beneficial but is not a mandatory requirement.

To avoid issues after the project selection algorithm, we encourage **all interested students** to write an email to Margarita to confirm eligibility for participation in the project and attach a CV and a short motivation statement. If you do not qualify for the project after an official allocation, you will need to find another one by yourself.

Leistungsnachweis

Active participation and interim presentations, practical problem-based work (both individual and in groups), and a project-based (scientific) report.

424210018 Multi-VRse: Social Adventures Across Virtual Worlds

B. Fröhlich, A. Lammert, T. Zöppig

Projekt

Beschreibung

With the latest generations of virtual reality headsets, the pass-through capabilities of these devices have greatly improved. This feature allows users to see the real world in three dimensions even when wearing the headset by superimposing camera images for the left and right eye. Thus, HMDs are now supporting both virtual reality and augmented reality applications.

In this project, we aim to explore how transitions between virtual and real worlds in social settings can be leveraged that take place within the same physical workspace. One approach will rely on an idea, where different virtual worlds are anchored in the real environment and can be explored individually or together.

To this end, we will review existing research and develop our own concepts and prototypes. Throughout the project, we will address the following questions: How can users join different virtual worlds in an intuitive way? What information is necessary to notify users already in a virtual world about joining users? How should transitions

between real and virtual worlds be designed? During the project, you will learn to design applications in the mixed reality continuum, implement these applications using Unity3D and C# and evaluate your systems with studies.

Bemerkung

Zeit und Ort werden zu Projektbörse bekannt gegeben!
The time and place will be announced at the project fair!

Voraussetzungen

Solid software programming / scripting experience (C#, C++, Python or similar).

Experience in Unity recommended. B.Sc. students should have computer graphics experience.

424210031 An AV pipeline for the Linux Dome 2.0

C. Wüthrich, N.N.

Projekt

Beschreibung

In this project, we will work on the finalization of the pipeline for the new FullDome at S134, which is a Linux based Dome with a 3D soundsystem and multiple projectors controlled by software.

This semester we will need to specify and build a Vulkan or Pipewire based System allowing to pipeline output from any video processing software into the input of a different video processing hardware, in a similar way that Syphon and Spout do it in the Mac and Windows environments.

424210032 Looking for a View: On the Role of Mutual Gaze for Coordination in Bicycle Traffic (MuGaGo)

J. Ehlers

Projekt

Veranst. SWS: 10

Beschreibung

In traffic situations, it is particularly important for road users to communicate with each other. Cyclists, more than anyone else, rely on eye contact to make sure they are seen or to anticipate the actions of drivers.

The current field study aims to investigate how cyclists' gaze information correlates with behavioral decisions.

We will collect eye-tracking data, verbal recordings and motor responses to enable comprehensive analyses of different traffic situations.

Voraussetzungen

Experience in Python programming is a prerequisite; knowledge of the experimental method is an advantage

Leistungsnachweis

- 1) Work yourself into the mobile eye tracking technique
- 2) Design an empirical study to quantify gaze patterns in traffic situations
- 3) Analyse your results using state-of-the-art techniques and document them in a laboratory report

424210033 Field Takes for Immersive Dome Content II

C. Wüthrich, W. Kissel

Projekt

Beschreibung

In this project, we will explore the real world to record environments for their projection in a Fulldome. After planning what we want to take, we will make shootings with a 360 degree camera and an ambisonics 3D microphone so that they can be projected in a Fulldome environment such as the Linux Fulldome at the Schwanseeestrasse 143 in Weimar. Focus of the project will be the definition of the workflow - both from the devices as well as from the software pipeline point of view.

The project will be interdisciplinary, with also students studying Computer Science at the Faculty of Media.

Research Project 2**424210001 Argumentative AI for Images and Texts****T. Gollub, K. Heinrich**

Projekt

Beschreibung

Arguments are increasingly communicated with images, especially in social media through memes.

In this project, we want to explore methods of how images can be retrieved or generated with AI to enhance the impact of arguments. We also want to investigate how such argumentative images can be automatically categorized and how they interact with other social media content.

Bemerkung

Zeit und Ort werden zu Projektbörse bekannt gegeben!
The time and place will be announced at the project fair!

Leistungsnachweis

Abschlusspräsentation und Ausarbeitung

424210002 Digital Dreams II**C. Wüthrich, W. Kissel, G. Pandolfo**

Projekt

Veranst. SWS: 10

Beschreibung

Herzlich willkommen bei Digital Dreams | Bauhaus Gamesfabrik, einem spannenden interdisziplinären Projekt, das die Fakultäten Kunst & Gestaltung und Medien an unserer Universität zusammenbringt. In diesem innovativen Projekt arbeiten Studierende unterschiedlicher Fachrichtungen in interdisziplinären Gruppen zusammen, um die dynamische Welt der Spieleentwicklung zu erkunden.

An der Schnittstelle von Kunst und Technologie dient Digital Dreams | Bauhaus Gamesfabrik als Spielwiese für Kreativität und Innovation. Studierende der Fakultät Kunst & Gestaltung bringen ihre Expertise in visueller Ästhetik, Erzählkunst und Konzeption ein, während diejenigen der Fakultät Medien ihre Fähigkeiten in Programmierung, Animation und interaktiven Medien einbringen.

In diesem gemeinschaftlichen Unterfangen werden interdisziplinäre Gruppen gebildet, die einen reichen Ideen- und Perspektivenaustausch fördern. Inspiriert vom Pioniergeist der Bauhaus-Bewegung, wo Kunst und Technologie zusammenkamen, um das moderne Design zu prägen, begeben sich unsere Studierenden auf eine Reise, um immersive und fesselnde Spielerlebnisse zu gestalten.

Im Laufe des Projekts vertiefen sich die Studierenden in verschiedene Aspekte der Spieleentwicklung, von der Ideenfindung und Prototypenerstellung bis hin zur Produktion und Präsentation. Unter der Anleitung eines erfahrenen Mentors beider Fakultäten lernen sie, die Komplexität interdisziplinärer Teamarbeit zu bewältigen und ihre einzigartigen Stärken zu nutzen, um Herausforderungen zu meistern und ihre kreative Vision zu verwirklichen.

Digital Dreams | Bauhaus Gamesfabrik ist mehr als nur ein Kurs; es ist eine transformative Erfahrung, die Studierenden ermöglicht, die Grenzen des traditionellen Spieldesigns zu überschreiten. Indem sie die Zusammenarbeit fördern und den Geist des Experimentierens annehmen, sind unsere Studierenden bereit, die nächste Generation visionärer Spieleentwickler zu werden und die Zukunft interaktiver Unterhaltung mitzugestalten.

Begleiten Sie uns auf dieser aufregenden Reise, auf der digitale Träume Wirklichkeit werden, und lassen Sie uns gemeinsam die Zukunft des Spielens an der Schnittstelle von Kunst und Technologie gestalten.

Bemerkung

Ort und Zeit werden zur Projektbörse bekanntgegeben.

Voraussetzungen

Studierende der Medieninformatik sollten Programmierkenntnisse mitbringen.

Studierende der Medienwissenschaft ein grundlegendes Interesse für Storytelling / Game Design

Leistungsnachweis

Abschlusspräsentation, fertiges Spiel.

424210004 Bobby Tables

S. Lucks, N. Lang, J. Leuther

Projekt

Beschreibung

Um zu verstehen, wie man ein sicheres System erstellt, fangen wir damit an, absichtlich ein unsicheres System zu bauen. Inspiriert von OWASP's Juice Shop (<https://help.owasp-juice.shop/>) ist unser Ziel, eine Plattform zu entwickeln, auf der Personen ihre Pentesting-Fähigkeiten üben können. Ausgehend vom Konzept des berühmten XKCD-Comics „Exploits of a Mom“ (<https://xkcd.com/327/>) möchten wir eine Plattform in einem Schulumfeld gestalten.

Voraussetzungen

At least one of the following:

- very good programming skills
- passed Webtechnologie
- passed Software Engineering
- passed Einführung in die Programmierung

Leistungsnachweis

Zwischenpräsentationen, Abschlusspräsentation, Abschlussbericht

424210005 Crush-testing Icons and Glyphs: how small can they get?

B. Fröhlich, D. Kiesel, I. López García

Projekt

Beschreibung

Icons und Glyphen sind gern genutzte Konzepte um kompakt multi-variate Daten darzustellen; sei es um Informationen auf einer Karte zu verorten, verschiedene Arten in einer Biodiversitätsstudie zu repräsentieren oder geloggte Interaktionssequenzen zu untersuchen. Typischerweise sind Glyphen eher klein, und ihre Größe kann verwendet werden, um geordnete Daten zu kodieren. Wie klein jedoch können die Glyphen eines Sets skaliert werden bevor einzelne Glyphen nicht mehr unterscheidbar sind? Können wir eine Metrik entwickeln, um vorherzusagen, ob die Glyphen in einem Glyphensatz bei kleinen Größen noch unterscheidbar bleiben?

Das Projekt wird sich mit diesen Fragestellungen beschäftigen. Dazu werden wir zunächst den Designspace von Glyphen erkunden, Glyphen typisieren, die existierende Literatur zur Skalierbarkeit von Glyphen (und verwandten Konzepten) analysieren und uns schließlich mit Hilfe einer Nutzerstudie Referenzwerte zur Glyphenähnlichkeit ermitteln. Auf Basis dieses Wissens werden wir Fehler-Typen in klein-skalierten Glyphen identifizieren und daraus Design-Guidelines und Mechanismen zur idealerweise automatischen Überprüfung der Unterscheidbarkeit von Glyphen entwickeln.

Voraussetzungen

Programming skills in Javascript. A completed Visualization course.

Leistungsnachweis

active participation during the project meetings; presentation of read literature; design, implementation and conduction of a user study; intermediate and final project presentation; final report.

424210006 Der Writer's Room - Kollaboratives Drehbuchschreiben mit KI

M. Gohsen, N. Mirzakhmedova

Projekt

Beschreibung

The essence of a great movie is its equally great script.

Writing a compelling script involves developing interesting characters, an exciting plot and convincing dialog. Although large language models (LLMs) have proven their potential to support these creative writing tasks, the generated texts usually lack depth and inventiveness.

This project aims to address these issues through human-AI collaboration and explore creative solutions to support screenwriting with LLMs. As part of this interdisciplinary project, you will learn how to write scripts, explore LLMs for their creative writing skills, and work closely with art and design students who will provide examples and feedback.

Bemerkung

Zeit und Ort werden zu Projektbörse bekannt gegeben!
The time and place will be announced at the project fair!

Voraussetzungen

- Passed one of the following courses: "Introduction to Machine Learning", "Introduction to Natural Language Processing" or "Softwareengineering II"
- Good programming skills

- Interested in creative writing

424210007 Distributed Wireless Sensor Systems and Applications

J. Ringert, B. Burse

Projekt

Beschreibung

We will develop low-cost distributed sensor nodes and apply them in a case study setting. The measured sensor data will be stored and made available for different analysis scenarios, e.g., exploring augmented building information models (BIMs).

engl. Beschreibung/ Kurzkomentar

Zeit und Ort werden zu Projektbörse bekannt gegeben!
The time and place will be announced at the project fair!

Voraussetzungen

Digital Engineering students must have completed their foundations.

Leistungsnachweis

Projektbericht und Ergebnisse in Form von Software.

424210008 Duplex Deep Dive

S. Lucks, N. Lang, J. Leuther

Projekt

Beschreibung

The „Duplex Mode” is an increasingly popular construction used in modern symmetric cryptography algorithms. One example is the authenticated encryption mode of the recent ASCON standard for Lightweight Cryptography (<https://www.nist.gov/news-events/news/2023/02/nistselects-lightweight-cryptography-algorithms-protectsmall-devices>).

The project idea is to consider new variants of the Duplex mode, which, if secure, could provide some practical benefits. Students shall challenge the security of those variants, both discovering attacks, if possible, and by searching for ideas for security proofs.

This project resembles the everyday activities of a researcher in the field and offers a good introduction into proper scientific work. Depending on the results, the objective for the students is to share their findings in form of a research paper which will be submitted to an international conference. If the paper is accepted, we can fund a student to travel to the conference and to present the paper.

This project pairs well with the Seminar „Current Topics in Cryptography: Authenticated Encryption” or with the lecture „Secure Channels”.

Voraussetzungen

- Introduction to Modern Cryptography (or equivalent)
- Interest in scientific work

Leistungsnachweis

Zwischenpräsentationen, Abschlusspräsentation, Abschlussbericht

424210009 Efficient Gaussian Splatting for Virtual Reality Applications

B. Fröhlich, A. Kreskowski, G. Rendle, S. Schneegans

Projekt

Beschreibung

Novel-view synthesis techniques based on Neural Radiance Fields [[Mildenhall et al. 2020](#)], Plenoxels [[Fridovich-Keil et al. 2022](#)], or, most recently and possibly most-well known, 3D Gaussian Splatting [[Kerbl et al. 2023](#), [Liu et al. 2024](#)] enable the visually high-fidelity reconstruction of surfaces which are hard or even near-impossible to reconstruct using classic photogrammetric approaches. Examples of such surfaces include fur, vegetation, transparent or translucent objects and thin structures in general. The novel-view synthesis approaches perform faithful interpolation of existing color information contained in a set of high-quality input images. Novel views can be rendered in real-time, provided one has access to powerful graphics hardware.

First research [[Lin et al. 2024](#)] has emerged which aims at reducing the rendering workload of weaker mobile devices using foveated rendering techniques. However, to enable the exploration of high-quality datasets in virtual reality applications, it is necessary to design rendering algorithms with e.g. output-sensitivity in mind. In the first part of this project, we will explore existing rendering and acceleration techniques for novel-view synthesis by example of **3D Gaussian Splatting**. After a detailed analysis of the rendering algorithms, we will design, implement and evaluate our own acceleration techniques for enabling real-time 3D Gaussian Splatting at high visual fidelity for state-of-the-art virtual reality devices.

In order to optimize performance for real-world datasets in virtual reality applications, we plan to explore an ocean floor dataset in virtual reality using head-mounted displays. The dataset will be captured and provided to us by the [MARUM - Center for Marine Environmental Sciences](#) at the beginning of our project.

If you are experienced or interested in real-time computer graphics and virtual reality, we would be excited to welcome you in our project. We will provide you with a Quest 3 for the duration of the project and together we will get our feet wet with our challenging real-world dataset and Efficient Gaussian Splatting for Virtual Reality!

Voraussetzungen

Solid software programming skills in C++ and a successfully completed computer graphics course or equivalent qualifications. Experience with GPGPU programming or algorithm design is helpful, but not required.

Leistungsnachweis

Active participation during the project meetings; design, implementation and evaluation of algorithms designed throughout the project; intermediate and final project presentations; final project report

424210012 Samples of One: Exploring Personal Data through Autobiographical Design and Auto-Ethnography

E. Hornecker, R. Koningsbruggen

Projekt

Beschreibung

Our personal lives are increasingly datified, with aspects that previously did not exist numerically being counted and used to make predictions on how we can live "*happier, fitter, and better*" lives [1]. Using quantification to flatten

complex topics, and present them in attractive and easy to read visualizations, these data present themselves as clean, neutral, objective, and standardized.

The results are personal data that lack personality. The data do not reflect us nor how we experienced them. For example, when communicating how sleepy we are, saying 'I am 5 sleepy' does not make much sense.

Therefore, this project explores how we can represent data in a more embodied and personal way through *dynamic data physicalisations*: physical artefacts that represent data through a change in their appearance.

To do so, we will draw on feminist, queer, intersectional, and more-than-human theories. Specifically, we will be looking into autobiographical design and auto-ethnography. Each student will be making their own, personal data physicalisation, live with this artefact, and conduct an auto-ethnographic study during this period.

This project will challenge you to explore what personal data are, how they align and differ from common data perceptions, and how to design for our new perceptions of personal data. Moreover, this project will introduce and give you experience with "auto-methods" (methods where you are your own user/target group).

This course is suited for students who like to be challenged to find problems, and who enjoy individual work and to come up with their own concepts. Students will focus on research topics such as "qualitative data representations", "data physicalisations", "data feminism", "showroom research", "critical design", and "speculative design". We encourage students to participate that have a high interest in working from theory, coming up with speculative concepts, and learn how to realise those concepts as an artefact. The project is most suited for students who want 18 ECTS.

1. Chris Elsdon, Mark Selby, Abigail Durrant, and David Kirk. 2016. Fitter, happier, more productive. *Interactions* 23, 5: 45–45. <https://doi.org/10.1145/2975388>
2. Yanni Alexander Loukissas. 2019. *All data are local: thinking critically in a data-driven society*. MIT Press, London.

Bemerkung

Zeit und Ort werden zu Projektbörse bekannt gegeben!
The time and place will be announced at the project fair!

Voraussetzungen

All participants should enjoy working in an interdisciplinary group, want to be creative, build prototypes, and be able to converse in English.

PD and MA: Please register until 16.10.2024 by sending an email to eva.hornecker@uni-weimar.de and rosa.donna.van.koningsbruggen@uni-weimar.de (please include a description of your prior experience in relevant areas or a portfolio).

424210013 Social Engineering – das Abenteuer geht weiter! II

A. Jakoby, S. Lucks, J. Ehlers, R. Adejoh, G. Pandolfo

Projekt

Beschreibung

Viele Cyber-Angriffe basieren auf Techniken des Social Engineering. Dazu gehören das Vortäuschen von Autorität, das Schreiben von Phishing-Mails, „Dumpster-Diving“ (das Durchsuchen von Abfällen nach nützlichen Informationen, die aus Leichtsinn weggeworfen wurden), usw.

Social Engineering nutzt menschliche Charakterzüge aus, zum Beispiel den Respekt für Autorität, die Bereitschaft anderen zu helfen, aber auch Leichtgläubigkeit und Faulheit. Ebenso setzt Social Engineering auf das Auslösen und Ausnutzen von menschlichen Emotionen, z.B. Furcht, Neugier, Hoffnung oder Schuldgefühle.

In dem Projekt geht es darum, Techniken des Social Engineering zunächst zu beschreiben und zu verstehen und nachfolgend ein (Computer-)spiel daraus zu entwickeln.

Der Spieler bzw. die Spielerin soll sich in eine Organisation „einhacken“. Dazu muss er oder sie nach und nach verschiedene Zugangsdaten in Erfahrung bringen und in verschiedene IT-Systeme einbrechen – natürlich unter Anwendung immer anderer Techniken des Social Engineering.

Das Spiel soll zunächst einmal als Text-Adventure gespielt werden. Bei einem erfolgreichen Projektverlauf könnte ein Folgeprojekt das Spiel zu einem graphischen Abenteuerspiel weiterentwickeln.

Leistungsnachweis

Zwischenpräsentationen, Abschlusspräsentation, Abschlussbericht

424210014 Software Engineering for Autonomous Vehicles

J. Ringert, .. Soaibuzzaman

Projekt

Beschreibung

We will develop software to control autonomous vehicles. The physical vehicle will be equipped with a range of sensors, e.g., LiDAR, cameras, gyroscopes, and distance sensors.

We will use industry strength software platforms like the Robot Operating System (ROS2).

Bemerkung

Zeit und Ort werden zu Projektbörse bekannt gegeben!

The time and place will be announced at the project fair!

Voraussetzungen

Digital Engineering students must have completed their foundations.

Leistungsnachweis

Projektbericht und Ergebnisse in Form von Software.

424210015 With a little help of... Exploring and Critically Reflecting Generative AI Tools in Design Ideation Processes

E. Hornecker, H. Waldschütz

Projekt

Beschreibung

Much has changed in the recent past: the creation of all kinds of creative content no longer seems to be the exclusive domain of humans. AI can help us ideate and create many types of output. But even though it can produce stunning results, they need to be curated, modified and adjusted to distinguish them from arbitrary results that lack motivation or personal touch.

In this course we'll explore and reflect on the role and impact of generative AI tools in creative ideation processes in interaction design, in particular large language models and image generation models. We will explore how we can use these technologies to complement and enhance our own creative processes, but also reflect on their limitations and how they can influence and even limit our own creativity. We will try to apply some structure to this

computer-assisted creativity to see if we can achieve less arbitrary, more original results. The course takes a hands-on approach to collaborative human-machine interaction and encourages critical reflection on the implications of using AI in creative endeavours. We will also take some of the ideas and prototype them.

Following a Research through Design (RtD) approach, we will work in small groups to conduct our research and develop some of the ideas, for example using prototyping technology such as *Arduino*, *Processing* and others. We will look at the literature in this area of research, investigate creative processes and develop ideas/concepts.

This course is perfect for students who want to be challenged to find problems, who enjoy individual and (multidisciplinary) group work, and who want to develop their own concepts.

Bemerkung

Zeit und Ort werden zu Projektbörse bekannt gegeben!
The time and place will be announced at the project fair!

Leistungsnachweis

Active participation and interim presentations, (practical) problem-based work (both individual and in groups), and a project-based (scientific) report.

424210016 Hot Topics in Computer Vision WiSe24/25

V. Rodehorst, C. Benz, J. Eick, A. Frolov, M. Kaisheva

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.

Bemerkung

Ort und Zeit werden zur Projektbörse bekanntgegeben.

Voraussetzungen

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

Leistungsnachweis

Aktive Mitarbeit, Einführungsvortrag, Abschlusspräsentation, Dokumentation

424210017 UX4UX: Designing a Web-Based Digital Tool for UX Experts

E. Hornecker, N.N., M. Osipova

Projekt

Beschreibung

The project UX4UX is offered in collaboration with Preetha Moorthy – UX expert and researcher. In this project we will be collaboratively designing a prototype of a web-based tool for visualizing usability attributes and recommended methods for the evaluation of wearable devices and companion mobile health applications.

This project gives you an opportunity to learn and put in practice design and prototyping skills under the supervision of Margarita and Preetha. The resulting prototype will be the first step towards a real product. The work will be done both individually and in teams.

We expect through this project active participation and interim presentations, practical problem-based work (both individual and in groups), and a project-based report.

The project's active phase runs till the end of March and the expected workload is approximately 2 working days per week for 12 ECTs and 3 working days for 18 ECTs.

We encourage all students to email Margarita with your CV to check whether you qualify for the project. Please feel free to reach out for more details or with any questions or clarifications to be sure that this project is a good fit for you.

margarita.osipova@uni-weimar.de

Bemerkung

In this project we also have the participation of MSc. Preetha Moorthy.

Zeit und Ort werden zu Projektbörse bekannt gegeben!
The time and place will be announced at the project fair!

Voraussetzungen

Students from HCI Masters: have successfully completed at least one of the following courses by HCI chair: "HCI Introductions", "HCI Research Methods", "Ubiquitous Computing".

Students from CS4DM Masters: have successfully completed at least one of the following courses by HCI chair: "HCI Introduction", "HCI Research Methods", "Ubiquitous Computing".

Completed "Data Visualization" course would be beneficial but is not a mandatory requirement.

To avoid issues after the project selection algorithm, we encourage **all interested students** to write an email to Margarita to confirm eligibility for participation in the project and attach a CV and a short motivation statement. If you do not qualify for the project after an official allocation, you will need to find another one by yourself.

Leistungsnachweis

Active participation and interim presentations, practical problem-based work (both individual and in groups), and a project-based (scientific) report.

424210018 Multi-VRse: Social Adventures Across Virtual Worlds

B. Fröhlich, A. Lammert, T. Zöppig

Projekt

Beschreibung

With the latest generations of virtual reality headsets, the pass-through capabilities of these devices have greatly improved. This feature allows users to see the real world in three dimensions even when wearing the headset by superimposing camera images for the left and right eye. Thus, HMDs are now supporting both virtual reality and augmented reality applications.

In this project, we aim to explore how transitions between virtual and real worlds in social settings can be leveraged that take place within the same physical workspace. One approach will rely on an idea, where different virtual worlds are anchored in the real environment and can be explored individually or together.

To this end, we will review existing research and develop our own concepts and prototypes. Throughout the project, we will address the following questions: How can users join different virtual worlds in an intuitive way? What information is necessary to notify users already in a virtual world about joining users? How should transitions

between real and virtual worlds be designed? During the project, you will learn to design applications in the mixed reality continuum, implement these applications using Unity3D and C# and evaluate your systems with studies.

Bemerkung

Zeit und Ort werden zu Projektbörse bekannt gegeben!
The time and place will be announced at the project fair!

Voraussetzungen

Solid software programming / scripting experience (C#, C++, Python or similar).

Experience in Unity recommended. B.Sc. students should have computer graphics experience.

424210031 An AV pipeline for the Linux Dome 2.0

C. Wüthrich, N.N.

Projekt

Beschreibung

In this project, we will work on the finalization of the pipeline for the new FullDome at S134, which is a Linux based Dome with a 3D soundsystem and multiple projectors controlled by software.

This semester we will need to specify and build a Vulkan or Pipewire based System allowing to pipeline output from any video processing software into the input of a different video processing hardware, in a similar way that Syphon and Spout do it in the Mac and Windows environments.

424210032 Looking for a View: On the Role of Mutual Gaze for Coordination in Bicycle Traffic (MuGaGo)

J. Ehlers

Projekt

Veranst. SWS: 10

Beschreibung

In traffic situations, it is particularly important for road users to communicate with each other. Cyclists, more than anyone else, rely on eye contact to make sure they are seen or to anticipate the actions of drivers.

The current field study aims to investigate how cyclists' gaze information correlates with behavioral decisions.

We will collect eye-tracking data, verbal recordings and motor responses to enable comprehensive analyses of different traffic situations.

Voraussetzungen

Experience in Python programming is a prerequisite; knowledge of the experimental method is an advantage

Leistungsnachweis

- 1) Work yourself into the mobile eye tracking technique
- 2) Design an empirical study to quantify gaze patterns in traffic situations
- 3) Analyse your results using state-of-the-art techniques and document them in a laboratory report

424210033 Field Takes for Immersive Dome Content II

C. Wüthrich, W. Kissel

Projekt

Beschreibung

In this project, we will explore the real world to record environments for their projection in a Fulldome. After planning what we want to take, we will make shootings with a 360 degree camera and an ambisonics 3D microphone so that they can be projected in a Fulldome environment such as the Linux Fulldome at the Schwanseeestrasse 143 in Weimar. Focus of the project will be the definition of the workflow - both from the devices as well as from the software pipeline point of view.

The project will be interdisciplinary, with also students studying Computer Science at the Faculty of Media.

Electives**324230019 Digital Culture in Design, Media and Architecture (Part 1)****J. Willmann, M. Braun, KuG**

Veranst. SWS: 2

Wissenschaftsmodul

Mo, Einzel, 13:30 - 15:00, Geschwister-Scholl-Str. 7 - 116, Introductory event, 21.10.2024 - 21.10.2024

Mo, wöch., 13:30 - 15:00, Geschwister-Scholl-Str. 7 - 116, Lecture, 28.10.2024 - 03.02.2025

Mo, wöch., 15:15 - 16:45, Geschwister-Scholl-Str. 7 - 116, Exercise, 04.11.2024 - 03.02.2025

Beschreibung

Die Veranstaltung findet auf Englisch statt. Über die Sprachumschaltflagge (oben rechts) gelangen Sie zur englischsprachigen Beschreibung.

Bemerkung

Bitte beachten Sie die entsprechende Studienordnung.

422250037 Formal Methods for Software Engineering**J. Ringert, .. Soaibuzzaman**

Veranst. SWS: 4

Vorlesung

Di, wöch., 09:15 - 10:45, Bauhausstraße 11 - R 015, Vorlesung, ab 15.10.2024

Fr, Einzel, 11:00 - 12:30, Bauhausstraße 11 - N 004, Sonstiges, 18.10.2024 - 18.10.2024

Fr, wöch., 11:00 - 12:30, Bauhausstraße 11 - R 015, ab 25.10.2024

Beschreibung

Formal methods are rigorous techniques for the mathematical analysis of software and hardware systems. This course introduces aspects of formal methods with applications to software engineering problems.

The topics covered in the course include:

- Introduction to Formal Methods
- Formal methods tools, e.g.,
 - SMT solvers on the example of Z3
 - Relational models and the Alloy Analyzer
 - Model Checking using SMV
- Applications of formal methods in practice

After completion students will be able to

- Model problems in different formalisms
- Analyze software models using formal method tools
- Evaluate formal methods for software engineering problems

Leistungsnachweis

Participation in exercises

Marked homework project including a presentation

424220000 Methods of Social Data Analysis

M. Jakesch

Veranst. SWS: 4

Vorlesung

Di, wöch., 15:15 - 16:45, Bauhausstraße 11 - R 015, Lecture / Übung, ab 22.10.2024

Mi, wöch., 11:00 - 12:30, Bauhausstraße 9a - Linux-Pool, Reservation only, ab 23.10.2024

Mi, wöch., 11:00 - 12:30, Bauhausstraße 11 - Pool G, Lab class / Übung, ab 23.10.2024

Beschreibung

Digital platforms and devices have become part of our daily lives, enabling us to collect data about human behavior on a scale unimaginable before. The analysis of social data offers new approaches to questions about human behavior and promises insights for business and politics. However, social data analysis is fraught with

analytical pitfalls. The downside of large, rich datasets is information overload, complicating the search for a viable approach. Analyzing data collected for different purposes in complex environments also easily leads to false conclusions. This course tries to equip students with basic skills for diving in social data. In a series of lectures, paper discussions, and hands-on project exercises, we will transform, describe, and make inferences about numeric, textual, and relational social data. We will also consider the ethics of social data analysis and its opportunities for social science more generally.

Voraussetzungen

Students will be asked to submit a course project proposal after the second class, based on which final admittance will be determined.

Leistungsnachweis

Individual presentations, course project in small groups, final exam.

424220001 An Introduction to Reflexive Thematic Analysis

E. Hornecker, R. Koningsbruggen

Veranst. SWS: 2

Seminar

Di, wöch., 09:15 - 10:45, Karl-Haußknecht-Straße 7 - Seminarraum (IT-AP) 001, ab 15.10.2024

Beschreibung

Ever wondered how to analyse your interview data? Or would you like to become more proficient in analysing qualitative data?

This seminar introduces you to the commonly used method: Reflexive Thematic Analysis. We will be discussing the origins of the method, why it was developed, the different types of thematic analysis, and how to conduct a thematic analysis. The latter we will do hands-on. We will both be using interview data as well as an other source of qualitative data: images. All participants will be analysing the data through the various steps of Reflexive Thematic Analysis. During class sessions, we will discuss the analysis together.

The seminar ends with a written report of the data that you analysed, accompanied with a reflection on what you learned.

The seminar is suited for students who would like to learn about or deepen their qualitative data analysis skills. The seminar is particularly advised for students who have started or are about to start their master thesis in HCI.

Voraussetzungen

Students need to have successfully passed either "HCI Introduction" or "HCI Theory and Research Methods". This seminar is ideal for those who have done their first attempts at qualitative research and want to deepen this, e.g. for their thesis.

If you want to take part in this seminar, please send a motivational email + relevant information to eva.hornecker@uni-weimar.de and rosa.donna.van.koningsbruggen@uni-weimar.de before 09.10.2024, midnight.

All participants should be interested in learning how to analyse qualitative data and be able to converse in English.

Leistungsnachweis

Active participation and interim presentations, a written report, and a written reflection on what you have learned.

424220002 Current Topics in Cryptography: Authenticated Encryption

S. Lucks, N. Lang, J. Leuther

Veranst. SWS: 2

Seminar

Do, wöch., 17:00 - 18:30, Bauhausstraße 11 - R 015, ab 17.10.2024

Beschreibung

Authentifizierte Verschlüsselung beschreibt das Zusammenspiel zwischen Verschlüsselungsalgorithmen (z.B. 1 AES im CBC-Modus) und Authentizitäts- und Integritätsalgorithmen (MACs), um ein zusammengehöriges Schema zur sicheren Kommunikation zu bieten.

In diesem Seminar bearbeiten Studierende jeweils selbständig ein ausgewähltes wissenschaftliches Thema im Bereich der authentifizierten Verschlüsselung. Das Thema wird in Absprache mit den Betreuenden gewählt.

Es wird jeweils Präsenztermine zum Auftakt, zur Zwischenpräsentation und zur Abschlusspräsentation geben.

Dieses Seminar lässt sich gut verbinden mit der Vorlesung „Secure Channels“ oder dem Projekt „Duplex Deep Dive“.

Bemerkung

Terminabsprache über Moodle-Kurs

Voraussetzungen

Introduction to Modern Cryptography (or equivalent)

424220003 Human factors: Basics of perception and cognition

J. Ehlers

Veranst. SWS: 3

Vorlesung

Di, wöch., 11:00 - 12:30, Karl-Haußknecht-Straße 7 - Seminarraum (IT-AP) 001, ab 15.10.2024

Beschreibung

How is our thinking organised? Do we all perceive the world in the same way? What directs our attention? The lecture provides an overview of the most important theories, findings and methods of cognitive psychology. Emphasis will be placed on visual information processing as well as on attention and memory models relevant to human-computer interaction. By the end of the semester, students should have acquired an understanding of the mechanisms of human cognition and be able to apply them to the design of good interaction designs. The course includes exercises with practical examples as well as guided data collection.

Leistungsnachweis

Practical exercises and written exam

4256303 Photogrammetric Computer Vision

V. Rodehorst, M. Kaisheva

Veranst. SWS: 4

Vorlesung

Mo, Einzel, 13:30 - 15:00, Bauhausstraße 11 - N 004, 1st Lecture, 14.10.2024 - 14.10.2024

Mo, wöch., 09:15 - 10:45, Marienstraße 13 C - Hörsaal C, Lecture, ab 21.10.2024

Mo, wöch., 11:00 - 12:30, Marienstraße 13 C - Hörsaal C, Lab class, ab 21.10.2024

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.

Bemerkung

Die Einschreibung für den Moodle-Kurs fängt am 25. September 2023 an.

Voraussetzungen

Einführung in die Informatik, Grundlagen Programmiersprachen

Leistungsnachweis

Erfolgreiche Bearbeitung der Übungen und des Projektes mit abschließender Klausur

4332010 Secure Channels

S. Lucks, N. Lang, J. Leuther

Veranst. SWS: 4

Vorlesung

Mi, wöch., 11:00 - 12:30, Karl-Haußknecht-Straße 7 - Hörsaal (IT-AP), Lecture, ab 16.10.2024

Di, wöch., 15:15 - 16:45, Karl-Haußknecht-Straße 7 - Hörsaal (IT-AP), Lab class, ab 22.10.2024

Beschreibung

Sicherheitsprotokolle in der Kryptographie

Ein Sicherheitsprotokoll dient der sicheren Kommunikation zwischen zwei oder mehr Teilnehmern. Einfache Sicherheitsprotokolle stellen die Grundfunktionen für andere Sicherheitsprotokolle dar, z.B. die authentische und vertrauliche Übermittlung von Datenpaketen.

In der Vorlesung werden die Anforderungen für Sicherheitsprotokolle vermittelt, und es werden die Stärken und Schwächen Sicherheitsprotokollen diskutiert. Zu den Schwächen gehören auch mögliche Implementationsfehler, die dazu führen, dass ein "an sich sicheres" Protokoll doch angreifbar ist.

Teilnehmerinnen und Teilnehmer der Vorlesung am Ende der Veranstaltung wissen,

- wie man die Sicherheit von Protokollen definiert,
- wie man Sicherheitsprotokolle analysiert und ggf.
- nachweist, dass ein konkretes Protokoll seine Anforderungen erfüllt und
- wie man Sicherheitsprotokolle korrekt implementiert.

engl. Beschreibung/ Kurzkomentar

Secure Channels

A secure channel, between two or more participants, provides privacy and integrity of the transmitted data. The goal of this course is to understand the principles of designing and analyzing secure channels. The students will learn to distinguish between a secure and an insecure design, by conceiving the basic ideas of secure channels:

- Formalizing the security requirements
- Analyzing existing protocol and channel designs
- How to prove the security of a given design
- Sound implementation of secure channels

Bemerkung

Die Veranstaltung ersetzt "Einfache Sicherheitsprotokolle" und kann daher nicht gemeinsam mit dieser Veranstaltung angerechnet werden.

Diese Vorlesung lässt sich gut verbinden mit dem Seminar „Current Topics in Cryptography: Authenticated Encryption“ und dem Projekt „Duplex Deep Dive“.

Voraussetzungen

Students must have passed a course that covers the basics of cryptography (e.g. Introduction to Modern Cryptography)

Leistungsnachweis

Mündliche Prüfung / oral exam

Beleg als Voraussetzung zur Prüfungszulassung. / Approval for examination is given on the basis of assignments.

4439110 Introduction to Machine Learning

B. Stein, J. Bevendorff, J. Kiesel, N. Mirzakhmedova

Veranst. SWS:

4

Vorlesung

Do, wöch., 09:15 - 10:45, Marienstraße 13 C - Hörsaal A, Lecture , ab 17.10.2024

Do, unger. Wo, 11:00 - 13:00, Marienstraße 13 C - Hörsaal A, Lab class, ab 24.10.2024

Beschreibung

In this course 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.

The lecture covers hypothesis spaces, model bias, regression for classification, logistic regression, effectiveness computation, loss function derivation, gradient descent, regularization, neural networks, decision trees, impurity functions, Bayesian learning. The lecture introduces concepts, algorithms, and theoretical backgrounds.

The accompanying lab treats both theoretical and applied tasks to deepen the understanding and hands-on experience of the field. Team work (2-3 students) is appreciated.

Bemerkung

Zeit und Ort werden zu Projektbörse bekannt gegeben!

Leistungsnachweis

Klausur

4447556 Digital Watermarking and Steganography

A. Jakoby, R. Adejoh

Veranst. SWS: 4

Vorlesung

Di, wöch., 11:00 - 12:30, Karl-Haußknecht-Straße 7 - Hörsaal (IT-AP), Lecture, ab 15.10.2024

Do, wöch., 15:15 - 16:45, Bauhausstraße 11 - R 015, Lab class , ab 17.10.2024

Beschreibung

Digitale Wasserzeichen und Steganography

Digitale Wasserzeichen dienen dazu Nachrichten zu einer Bild-, Audio- oder Videodatei innerhalb dieser Datei selber abzulegen. Ein zentrales Ziel der hierzu verwendeten Verfahren ist es, sicherzustellen, dass die eingebetteten Informationen nicht wieder entfernt werden können. Solche Nachricht können dazu herangezogen werden, um zusätzliche Informationen über den Inhalt der Medien selbst zu liefern, so zum Beispiel bestehende Urheberrechte. Digitale Wasserzeichen sollen daher lesbarer oder zumindest nachweisbar sein. Jedoch sollen sie nur mit erheblichen Aufwand wieder zu entfernen sein.

In der Steganographie untersuchen wir Systeme, in denen die eingebetteten Informationen vollständig für Unbefugte versteckt werden soll. Selbst die Tatsache, dass eine Mediendatei eine versteckte Botschaft enthält, soll für Unbefugte nicht zu beobachten sein. Somit ist es durch Verwendung eines solchen Systems möglich, dass zwei Personen Informationen austauschen, ohne dass eine dritte Person die Kommunikation detektieren kann.

In dieser Vorlesung werden wir grundlegende Konzepte, Methoden und Anwendungen der digitalen Wasserzeichen und Steganographie vorstellen und analysieren.

engl. Beschreibung/ Kurzkomentar

Digital Watermarking and Steganography

Digital watermarking is the practice of hiding a message about an image, audio clip, video clip, or other work of media within that work itself. One goal of the used methods is to ensure that the message cannot be removed after it is embedded in the media. Thus, systems can use such a message to provide additional information of the content of the media itself, e.g. copyrights. Digital watermarks have to be readable or detectable, but they should be hard to remove from the content.

In steganography we investigate systems where the embedded information is completely hidden for unauthorized parties. Even the fact that a media file contains a hidden message should be hidden. Thus, by using such a system two parties can communicate in such a way that a third party cannot detect the communication.

In this lecture we will introduce some basic concepts, methods and applications of digital watermarking and steganography.

Voraussetzungen

BSc in a relevant study field

Leistungsnachweis

oral examination

4526501 Academic English Part One

G. Atkinson

Veranst. SWS: 2

Kurs

Mi, wöch., 15:15 - 16:45, Consultations, R.N212, B11 (indiv.appointments), ab 06.11.2024

Mi, wöch., 17:00 - 18:30, Bauhausstraße 11 - R 015, Academic English Part I+II (alternating), ab 06.11.2024

Beschreibung

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 in reverse order or concurrently (i.e. in the same semester). You may only do the latter on the authority of the course leader (Atkinson).

Voraussetzungen

Registration (compulsory)

All students must register. First time participants are required to present a B2 English Level certificate along with their email registration. All students, **including those who have already taken Academic English Part Two and those who need to repeat Academic English Part One**, must register by contacting Howard Atkinson at: howard.atkinson@uni-weimar.de.

You will be informed by email when registration opens and when the deadline is. Please do not attempt to register until you have received this Email. Registration Emails should be given the subject heading: AE I Registration.

Leistungsnachweis

continuous assessment

4526502 Academic English Part Two

G. Atkinson

Veranst. SWS: 2

Kurs

Mi, wöch., 15:15 - 16:45, Consultations, R.N212, B11 (indiv.appointments), ab 06.11.2024

Mi, wöch., 17:00 - 18:30, Bauhausstraße 11 - R 015, Academic English Part I+II alternating, ab 06.11.2024

Beschreibung

Part Two of the Academic English course concentrates on improving and refining aspects of academic writing style. It includes sections on clause and sentence structure, punctuation rules and how to incorporate quotations, statistics and footnotes into academic texts.

Bemerkung

You are advised to take Part One first, although it is possible to take both parts in reverse order or concurrently (i.e. in the same semester). You may only do the latter on the authority of the course leader (Atkinson).

Voraussetzungen

Registration (compulsory)

All students must register. First time participants are required to present a B2 English Level certificate along with their email registration. All students, **including those who have already taken Academic English Part One and those who need to repeat Academic English Part Two**, must register by contacting Howard Atkinson at: howard.atkinson@uni-weimar.de.

You will be informed by email when registration opens and when the deadline is. Please do not attempt to register until you have received this Email. Registration Emails should be given the subject heading: AE II Registration.

Leistungsnachweis

continuous assessment

4556216 Ubiquitous Computing

E. Hornecker, R. Koningsbruggen, M. Osipova, H. Waldschütz

Veranst. SWS: 4

Vorlesung

Di, wöch., 13:30 - 15:00, Karl-Haußknecht-Straße 7 - Hörsaal (IT-AP), Lab class / first lecture (October 11th, 2022) , ab 15.10.2024

Mo, wöch., 13:30 - 15:00, Karl-Haußknecht-Straße 7 - Hörsaal (IT-AP), Lecture, ab 21.10.2024

Beschreibung

The course covers the research area and technology field of Ubiquitous Computing (UbiComp). UbiComp technologies move beyond 'traditional' computing concerns, moving from the desktop into the world, from the workplace to the home and other settings [e.g., domestic, public spaces], from purely functional to ludic concerns [e.g. home entertainment, pervasive games], and from digital to digital-physical systems [tangible computing, IoT].

The course covers technical aspects as well as design issues, and addresses user-centered design, concept prototyping and evaluation methods relevant for Ubiquitous Computing. It includes discussion of broader societal and value-related concerns (e.g. privacy, security, user agency versus ambient intelligence). We will discuss and reflect on concerns, perspectives and the interdisciplinary nature of UbiComp.

Successful students should be able to

- discuss the diverse and emergent areas within UbiComp technologies and the issues entailed
- develop concepts for UbiComp applications that are appropriate for a given use context and illustrate these (sketching, video prototyping, Wizard of Oz) as well as determine their technical feasibility

- be able to reflect on practical experiences engaging with some of these technologies from a user-centred perspective
- understand the technical functioning of example UbiComp technologies
- choose and provide a rationale for appropriate user-centered design methods for exemplary application problems
- critically assess societal implications and discuss design trade-offs of UbiComp applications.
- Critically reflect on technology visions
- understand complex issues from the HCI and UbiComp research literature, in particular, to summarize literature and to discuss it

Bemerkung

Note: This course is offered biannually

Leistungsnachweis

practical problem-based coursework, mostly done in group work. Final individual project-based report.

4556228 Virtual Reality

B. Fröhlich, K. Brehm, E. Schott, T. Zöppig

Veranst. SWS: 4

Vorlesung

Do, wöch., 13:30 - 15:00, Bauhausstraße 11 - R 015, Lecture, ab 17.10.2024

Fr, wöch., 09:15 - 10:45, Übung Gruppe A VR-Lab, R.N104, B11, ab 18.10.2024

Fr, wöch., 11:00 - 12:30, Übung Gruppe B VR-Lab, R.N204, B11, ab 18.10.2024

Beschreibung

Virtual Reality (VR) erfreut sich seit mehreren Jahren großer Beliebtheit in Forschung, Unterhaltung und Bildung. VR-Systeme ermöglichen die Interaktion einer oder mehrerer Benutzer*innen mit einer computersimulierten Umgebung, welche dreidimensional auf einem stereoskopischen Display dargestellt wird. In dieser Veranstaltung lernen Sie die theoretischen, technischen und angewandten Grundlagen moderner Virtual Reality-Systeme genauer kennen.

Die Vorlesung beginnt mit den Grundlagen der Computergrafik und des stereoskopischen Sehens, welche zur Realisierung von VR-Anwendungen erforderlich sind. Danach werden Sie verschiedene 3D-Eingabegeräte und 3D-Interaktionstechniken wie Selektion, Manipulation und Navigation in virtuellen Umgebungen kennenlernen. Der letzte Teil des Kurses baut auf dem bereits erworbenen Wissen auf und konzentriert sich auf kollaborative VR-Systeme für mehrere am gleichen oder an verschiedenen Orten befindliche Benutzer*innen.

Die Vorlesung wird von Laborveranstaltungen begleitet, welche neueste Virtual Reality-Technologien wie Multi-Viewer-3D-Projektionssysteme und hochauflösende Head-Mounted Displays einsetzen. Im Rahmen der Übungsaufgaben werden Sie verschiedene 3D-Interaktionstechniken für diese immersiven Displays sowie unter Nutzung von räumlichen Trackingsystemen und 3D-Eingabegeräten implementieren und auswerten. Je nach Situation können Sie auch von zu Hause aus an den Übungen arbeiten.

Wir planen, ausgewählte Vorlesungen und Übungen direkt in virtueller Realität durchzuführen, um das Konzept „Teaching VR in VR“ zu testen. Dazu werden wir nach Möglichkeit alle Teilnehmer*innen mit HMDs ausstatten.

Bemerkung

Digital Engineering or MediaArchitecture students may also attend this lecture if they have already acquired the necessary programming skills through successful completion of appropriate courses and are able to demonstrate their skills at the beginning of the lab course. If you are interested in attending this course, please contact Prof. Fröhlich or one of his staff members named above.

Voraussetzungen

Basic knowledge of computer graphics is recommended. Fundamental programming skills are required.

Digital Engineering or MediaArchitecture students may also attend this lecture if they have already acquired the necessary programming skills through successful completion of appropriate courses and are able to demonstrate their programming skills at the beginning of the lab course. If you are interested in attending this course, please contact Prof. Fröhlich or one of his teaching assistants named above.

Leistungsnachweis

Vorlesungsbegleitende, bewertete Übungen, mündliche Prüfung und ein abschließendes Projekt.

4556233 Computer Graphics II: Fundamentals of Imaging

C. Wüthrich

Veranst. SWS: 4

Vorlesung

Fr, wöch., 15:15 - 16:45, Marienstraße 13 C - Hörsaal B, ab 18.10.2024

Mo, wöch., 15:15 - 16:45, Bauhausstraße 11 - N 004, Vorlesung, ab 21.10.2024

Beschreibung

Algorithmen und Datenstrukturen

engl. Beschreibung/ Kurzkomentar

Computer Graphics II: Fundamentals of Imaging

In Computer Graphics, and also in Image processing and in Design, professionals are used to speak about "better" or "worse" quality for pictures. Contrary to popular belief, however, there is no general method for analyzing the quality of picture. The course will start with a wide introduction to light transport and reflection theory, continue with a trip through digital and analogue image capture and reproduction and a survey of image compression methods. In its last part the course will focus on methods for evaluating the quality of pictures and of animated sequences, revealing advantages and disadvantages of different display and printing techniques and of the different compression methods.

Bemerkung

Die Veranstaltung wird letztmalig angeboten.

Leistungsnachweis

Beleg, Klausur

oral exam, individual appointments via Moodle

904003/ 439100 Raumbezogene Informationssysteme/ Spatial information systems (GIS)

T. Gebhardt, V. Rodehorst

Veranst. SWS: 4

Integrierte Vorlesung

Fr, wöch., 13:30 - 15:00, Marienstraße 13 C - Hörsaal A, Übungen, ab 25.10.2024

Mi, wöch., 09:15 - 10:45, Marienstraße 13 C - Hörsaal A, Vorlesungen

Beschreibung

Die Vorlesung vermittelt vertiefte Grundlagen raumbezogener Informationssysteme, wie z.B. die Aufnahme, Organisation, Analyse und Präsentation raumbezogener Daten. Die Themen umfassen geographische Daten und frei verfügbare Ressourcen, Referenzsysteme und Kartennetzentwürfe, Geo-Datenbanken und effiziente Datenstrukturen, geometrische und topologische Datenanalyse, kartographische Generalisierung und Visualisierung sowie GIS im Planungskontext.

Bemerkung

Für die Selbsteinschreibung in den zugehörigen MOODLE-Lernraum (Hyperlink siehe oben!) lautet das Passwort:
spatial24

Leistungsnachweis

Erfolgreiche Bearbeitung der Übungen und des Projektes mit abschließender Klausur