

Welcome to the Seminar Presentation for Summer 2020



Time	Degree	Seminar	Chair	Presenter
18:00	Bachelor & Master	Introduction & General Information		Fabian Wirth
18:02	M.Sc. Comp. Math.	Seminar in Pure Mathematics	Pure Mathematics, Prof. Dr. Tobias Kaiser	Tobias Kaiser
18:07	B.Sc., M.Sc. Comp. Sci.	Advanced Seminar: Data Science	Data Science, Prof. Dr. Michael Granitzer	Jörg Schlötterer
18:12	B.Sc. Comp. Sci. & Internet Computing & Comp. Math., M.Sc. Comp. Sci. & Comp. Math. & MES	Reasoning About Time	Information Management, Prof. Dr. Burkhard Freitag	Christina Ehrlinger

Time	Degree	Seminar	Chair	Presenter
18:17	M.Sc. Comp. Sci.	Topics in Deep Learning Algorithms for Autonomous Driving Applications	ITK Engineering GmbH, Dr. Stefan Held	--
18:22	B.Sc., M.Sc. Comp. Sci.	Search-Based SE for Testing Autonomous Cars	Software Engineering II, Prof. Dr. Gordon Fraser	Alessio Gambi
18:27	B.Sc., M.Sc. Comp. Sci.	Program Analysis for Dynamic Languages and Functional Languages	Software Engineering II, Prof. Dr. Gordon Fraser	N.N.

Time	Degree	Seminar	Chair	Presenter
18:32	M.Sc. Comp. Sci., M.Sc. MES	Modeling Smart Grid Systems and Services	Computer Networks and Computer Communications, Prof. Dr. de Meer	Philip Danner
18:37	Lehramt Gy, B.Sc. Math, Comp. Sci, & Internet Comp., M.Sc. Comp. Math. & Comp. Sci.	Angewandte Mathematik im Mathe-Museum (Skill.de)	Applied Mathematics, Prof. Dr. Brigitte Forster-Heinlein	--
18:42	B.Sc. Comp. Sci. & Internet Computing, M.Sc. Comp. Sci.	Cloud Computing	Security in Information Systems, Prof. Dr. Reiser	Philipp Eichhammer

Compulsory Seminars

Bachelor Computer Science

1 Seminar

Bachelor Internet Computing

1 Seminar

Bachelor MES

1 Seminar

Bachelor Mathematics

1 Seminar

LA Mathematik

1 Seminar

Compulsory Seminars

Master MES

1 Seminar

Master Computer Science

1 Seminar

Master Computational Mathematics

2 Seminars

Elective Seminars

M.Sc. Computer Science only, this semester only offered to fill remaining places.

At most 1 seminar in each module group / specialisation area.

- Algorithmics and Mathematical Modelling (AlgMath)
- Programming and Software Systems (ProgSoft)
- Information & Communication Systems (InfComm)
- Intelligent Technical Systems (ITS)
- IT Security and Reliability (ITSecRel)

Please note that only ONE seminar per module group will be credited!

Enrollment

M.Sc. Computer Science and M.Sc. Computational Mathematics

At the beginning of semester
declare whether seminar is
compulsory or elective.

HOW?

General Information

Anmeldeliste bzw. Notenliste für Seminararbeiten

zur Übermittlung an das Prüfungssekretariat

Datum: _____

1. Angaben durch die/den betreuende/n Prüferin / Prüfer: _____

Sommersemester _____ / Wintersemester _____

Veranstaltungsnummer: _____ genaue Bezeichnung des Seminars: _____

Bachelorstudiengang		Masterstudiengang		weitere Studiengänge
☐ Internet Computing	Pnr. 401390 Seminar Pnr. 401136 Proseminar	☐ Informatik Dieses Seminar wird nicht als Forschungsseminar angeboten! (Not a Research Seminar!)	Pnr. 450001 Pflichtseminar (PO 20161) Pnr. 450001 Seminar (PO 20122 alle Schwerpunkte) (Für Studierenden im M.Sc.INF alte PO ist zur Zuordnung die Angabe des Vertiefungsschwerpunktes erforderlich!)	☐ Lehramt Gymnasium Pnr. 784751
☐ Informatik	Pnr. 401320			☐
☐ Mobile und Eingebettete Systeme	Pnr. 446100 Seminar	☐ Mobile and Embedded Systems	Pnr. 470001 Pflichtseminar	☐
☐ Mathematik	Pnr. 411401 Seminar Pnr. 411402 Proseminar	☐ Computational Mathematics der Prüfungsordnung (PO20181)	Pnr. 481001 Pflichtseminar 1 / Pnr. 481002 Pflichtseminar 2 Pnr. 482110 Seminar in Algebra, Geometry and Cryptography Pnr. 482210 Seminar in Mathematical Logic and Discrete Mathematics Pnr. 482310 Seminar in Analysis, Numerics and Approximation Theory Pnr. 482410 Seminar in Dynamical Systems and Optimization Pnr. 482510 Seminar in Stochastics, Statistics	

2. Angaben durch die Studierenden:

Grau hinterlegte Spalten werden von der Teilnehmerin/ dem Teilnehmer des Seminars gut lesbar in Druckschrift mit der Prüfungsnummer (siehe Aufstellung oben) ausgefüllt. Bei einem Doppelstudium füllen Sie bitte eine zweite Zeile aus, wenn das Seminar dort ebenfalls verbucht werden kann. Studierende im M.Sc.INF geben mit der Prüfungsnummer (Pnr.) an, ob das Seminar als Pflichtseminar oder als Forschungsseminar abgelegt wird.							Angaben durch die/den betreuenden Prüfer	
Nr.	Name, Vorname	Abschluss B.Sc. oder M.Sc.	Studien- gang IC / INF/ MAT / MES	Prüfungsnummer (Pnr.)	Nur bei M.Sc.INF (nach Prüfungsordnung 07.02.13 gewählter Vertiefungs- schwerpunkt erforderlich z. B. Alg + Math)	Unterschrift	Matrikelnummer Aus Datenschutzgründen erfolgt eine Angabe der Matrikelnummer erst bei Abgabe auf der Seminararbeit	Note
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Die Abgabe der fertigen Seminararbeit erfolgt jeweils zum 30.09. für das Sommer- bzw. zum 31.03. für das Wintersemester. Eine Nichtabgabe der Seminararbeit führt zur Eintragung „Nicht angetreten“ = Note 5,0

Bei Weitergabe dieser Liste durch den Lehrstuhl an das Prüfungssekretariat gilt dies als verbindliche Prüfungsanmeldung in HISQIS / Weitergabe ☐ ja ☐ nein
Bearbeitungsvermerk durch das Prüfungssekretariat: Leistung im System angemeldet _____ / eingetragen _____

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Pflichtseminar = Compulsory Seminar

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☐ Informatik	Pnr. 401320	Weiteres Forschungsseminar Jeweils 1 x möglich in der jeweiligen Schwerpunktmodulgruppe (PO 20161) nach Einhaltung der sonstigen Regeln der Prüfungsordnung (PO)	Pnr. 451010 Algorithmik und Mathematische Modellierung Pnr. 452010 Informations- und Kommunikationssysteme Pnr. 453010 Programmiermethoden und Softwaresysteme Pnr. 454010 Intelligente Technische Systeme Pnr. 455010 IT-Security and Reliability	☐
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☐ Mathematik				

Masterstudiengang

☐ Informatik

Weiteres Forschungsseminar

Jeweils 1 x möglich in der jeweiligen
Schwerpunktmodulgruppe (PO 20161)
nach Einhaltung der sonstigen Regeln
der Prüfungsordnung (PO)

☐ Mobile and Embedded Systems

☐ Computational Mathematics der Prüfungsordnung (PO20181)

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Pnr. 450001 Seminar (PO 20122 alle Schwerpunkte)

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2. Angaben durch

Grau hinterlegte
ausgefüllt. Bei ein
Studierende im

Nr. Name, Vorname

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Die Abgabe der

Bei Weitergabe

Bearbeitungsve

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Seminar in Pure Mathematics

Tobias Kaiser

Universität Passau

23. Januar 2020

Topics of the **Seminar in Pure Mathematics** 5867OS:

- ▶ Geometry (Real Algebraic Geometry, Real Analytic Geometry)
- ▶ Logic (Model Theory, O-Minimal Structures)
- ▶ Algebra (Real Algebra, Commutative Algebra)

Master **Computational Mathematics**:

- ▶ General Seminar
- ▶ Seminar in the Module Group *Algebra, Geometry and Cryptography*

Interested students please contact Prof. Dr. Tobias Kaiser (tobias.kaiser@uni-passau.de). We will find for you an interesting topic for the seminar according to your interests.

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5779HS Advanced Seminar: Data Science

Advanced Topics in Machine Learning & Data Science

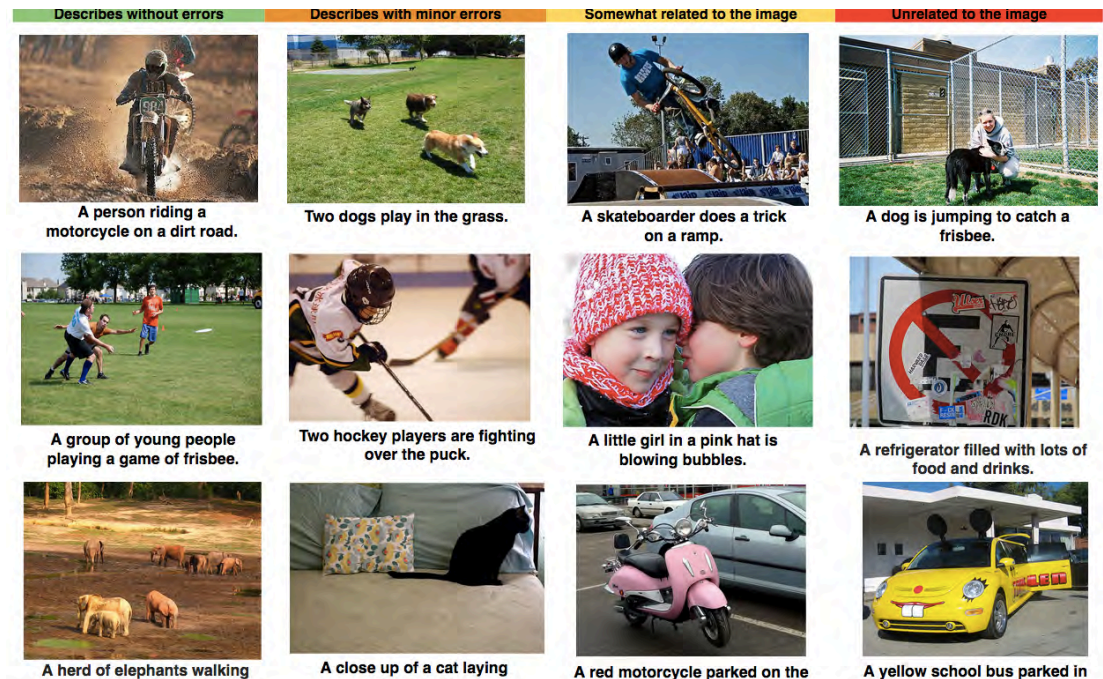
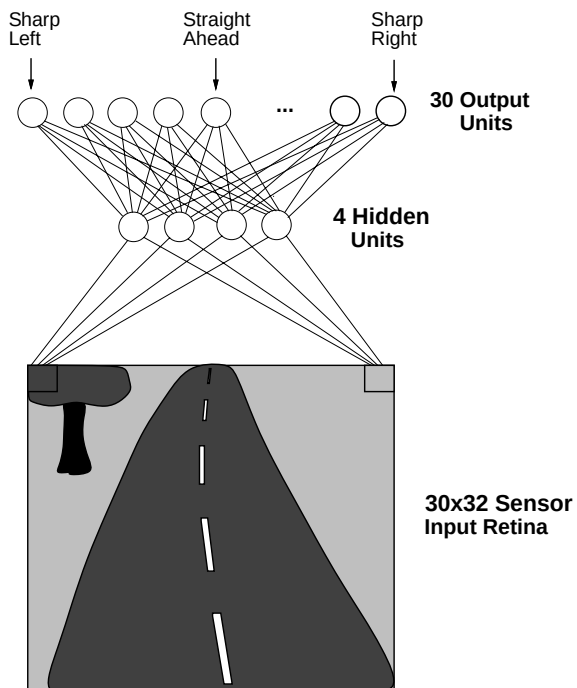
Prof. Michael Granitzer

Jörg Schlötterer

Chair of Data Science

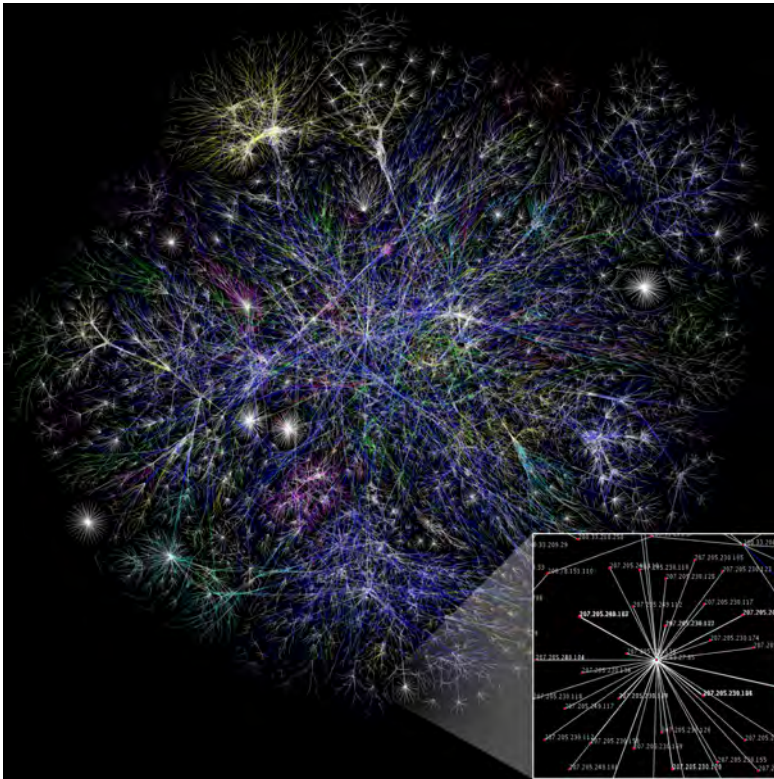
Machine Learning

"A Computer Programm learns form experience with respect to some task and a performance measure if its performance over the task improves with experience" [Mitchell 1997]



Data Science

“Data Science researches and applies technologies, systems and algorithms to gain knowledge from potentially large, heterogeneous and dynamically changing data sets [for a particular domain]” [Dhar 2013]



Topics in the Seminar

Advanced Topics in Machine Learning and Data Science

- Advanced Machine Learning Paradigms: Active Learning, Reinforcement Learning, Semi-Supervised Learning, Zero-Shot Learning
- Deep Learning for Network Science with a particular focus on Graph Embeddings
- Reproducibility and Reliability of Machine Learning: Meta Learning, Evaluation Measures, Experiment Comparison
- Integrating Background Knowledge in Machine Learning Systems
- Visual Analytics: Applications and Frameworks, Visual Analytics for Deep Learning

Types of Work

- **Survey:** literature research, comparison of 10-20 state of the art papers.
- **Experiment:** literature and software research, development of a small experiment, aggregation of results, hyperparameter study, report of results

Organisation

Fields of Study

- Master Computer Science
 - Bachelor Computer Science
 - Bachelor Internet Computing
- ➔ Difficulty will be adapted for BA Students

Grading

- Report of 4 pages ACM Format (excl. references) for Experimental Papers and 6 pages ACM Format (excl. references) for Survey Papers (<https://www.acm.org/publications/proceedings-template> - sigconf option)
- Presentation: 20 minutes + max. 10 minutes discussion
- Review of two papers from other students (your review will not influence the grade of your colleagues, but your own grade).
- Detailed criteria will be given when we introduce the scientific working process

Timeline

We will run a “mini-conference”

- February-April:
 - Topic Selection
- April/Mai:
 - Q&A on the topic
 - Presentations on scientific working (processes, citation, writing, presentation)
- Mai/ June
 - Research and Implementation
- Mid of June
 - Paper submission + peer review (2 reviews)
- July
 - presentations
- September
 - Final seminar paper

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SEMINAR

„REASONING ABOUT TIME“

Christina Ehrlinger

Chair of Information Management
Professor Dr. Burkhard Freitag

22.01.2020

-
- A painting of a busy square in Vienna, featuring a large obelisk in the foreground and a large building under renovation in the background. The square is filled with people, horse-drawn carriages, and street vendors. The building in the background is covered in scaffolding, indicating ongoing construction or restoration work. The scene is set in a historical context, likely the 19th century.

The diagram illustrates a timeline of events for a person. The timeline is represented by a horizontal axis with vertical tick marks. The events are labeled as follows:

- Birth**: 1862
- Date of Birth**: 1907
- Date of Death**: 1935

Below the timeline, there are two boxes representing specific events or documents:

- Natal register**: A box with a purple border, containing the text "Natal register". A purple arrow points from this box to the "Date of Birth" tick mark (1907).
- Beginning renovation work ... at the age of 50**: A box with a blue border, containing the text "Beginning renovation work ... at the age of 50". A blue arrow points from this box to the "Date of Death" tick mark (1935).

A green arrow points from the top of the timeline to the "Date of Birth" tick mark (1907).

22.01.2020

- Artificial Intelligence
- Data Modeling
- Semantic Technologies
- Database Systems

- Theoretical Principles
e.g. time calculi, time logics, ...
- Representation of Time
e.g. explicit, implicit, granularity...
- Temporal Reasoning
e.g. interval-based inference, constraint propagation, ...
- Temporal SQL
- Systems

- **Bachelor/Master Students**
 - **Firm theoretical background required**
 - In particular
 - Graph Theory
 - First Order Logic
- **Preliminary Registration** in Stud.IP (5748S)
- **Kickoff Meeting in the first week of the summer term**
 - Exact date will be announced in Stud.IP
- Topic assignment after kickoff meeting
 - Underlying papers will be available in Stud.IP for getting in touch with the topics

Achievements required:

- Presentation of your topic prepared by yourself (45 min + discussion) based on
 - The suggested starting paper
 - At least three additional papers (related work, further literature)
- Good background knowledge of your topic
- Written summary of your topic (up to 10 pages)
- Active participation in all sessions of the seminar

Contact:

- Christina.Ehrlinger@uni-passau.de

Time	Degree	Seminar	Chair	Presenter
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18:22	B.Sc., M.Sc. Comp. Sci.	Search-Based SE for Testing Autonomous Cars	Software Engineering II, Prof. Dr. Gordon Fraser	Alessio Gambi
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Topics in deep learning algorithms for autonomous driving applications

Dr.rer.nat. Stefan Held

Lehrbeauftragter, Universität Passau,
Expert Engineer, ITK Engineering GmbH
held19@ads.uni-passau.de

Introduction

Goals

- Main Goal:

Investigate and critically discuss approaches, methods and problems for machine learning for autonomous vehicles

- Additional goal:

research a topic, write a scientific publication and present it:

- literature research: understand the given literature and find relevant further literature
- isolate the relevant information
- write a scientific paper (8 pages in IEEE double column template)
- prepare and give your presentation (30 min)
- Attend the presentations

Conditions

- Supervision and cooperation will be via team chat (slack or similar)
- Two "conferences" for talks
- Attendance at the conferences is mandatory
- There will be 12 topics
- There is some reference for each topic to check before applying
- Introduction of the topics: *Room (IM) 004 on 03.04.2020 at 14:00 o'clock*
- Students who are in their last semester will be prioritized (60 ECTS Points)

The topics

Themes

There will be three themes in which the topics will fall:

- Perceptual uncertainty - Do deep neural networks know what they don't know?
- Sparse networks and the training lottery - Can we reduce the size of deep neural networks?
- Quantization of CNN - Can we transfer deep neural networks to embedded devices.

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Search-Based SE for Testing Autonomous Cars

StudIP 5846HS



Dr. Alessio Gambi (alessio.gambi@uni-passau.de)

Chair of Software Engineering II

Investigate and critically discuss state-of-art approaches to design self-driving car software and systematically testing them

Implement those approaches as prototypes and demonstrate their use to a general audience

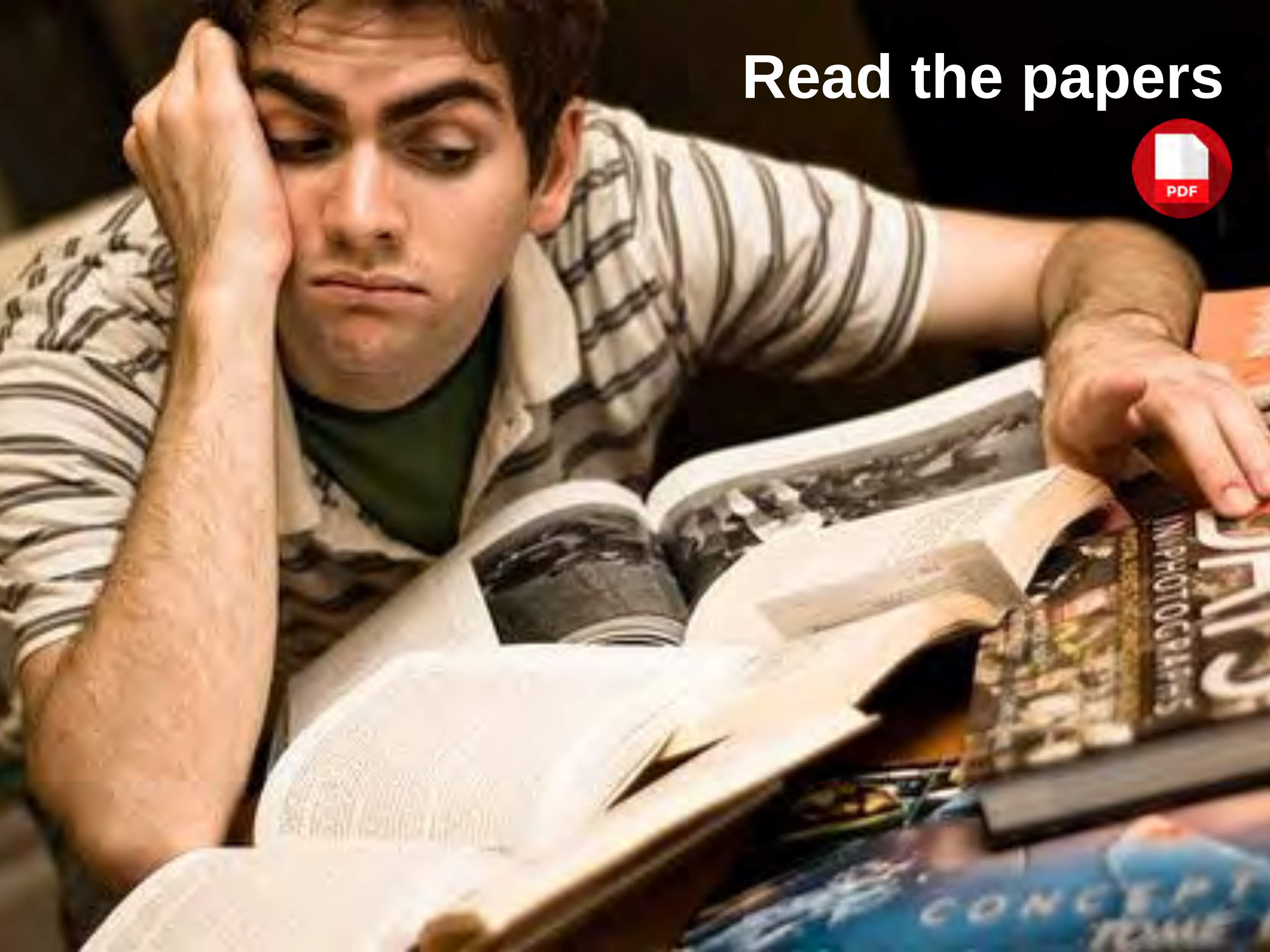
Reference Topics

- Self-driving cars implementations
- Automatic test generation using search
- Boundary identification & parameter exploration
- Automatic generation of critical scenarios
- Adversarial testing
- Using formal methods for test case generation



Format of the seminar

Read the papers



Format: 2 Pages



Front

1/2 Page summary

1/2 Page critical content

Back

2+ Critical questions

4+ Related Word

Moderate the discussion
Active participation is mandatory
Attendance is mandatory



Introductory talk



PechaKucha™

20 X 20

IMAGES

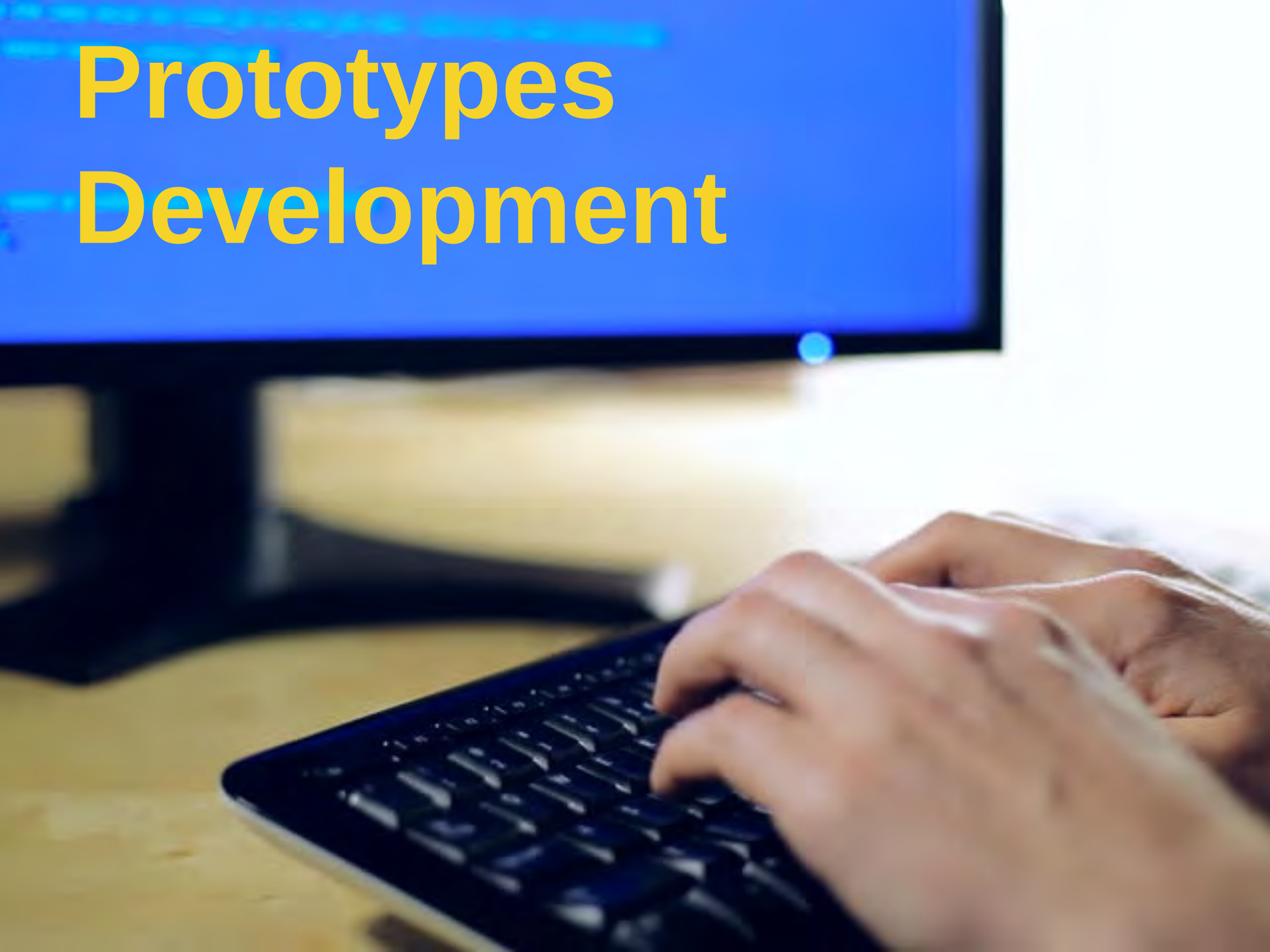
SECONDS



Each week, a different student introduces the paper and moderate the discussion

<http://www.pechakucha.org/>

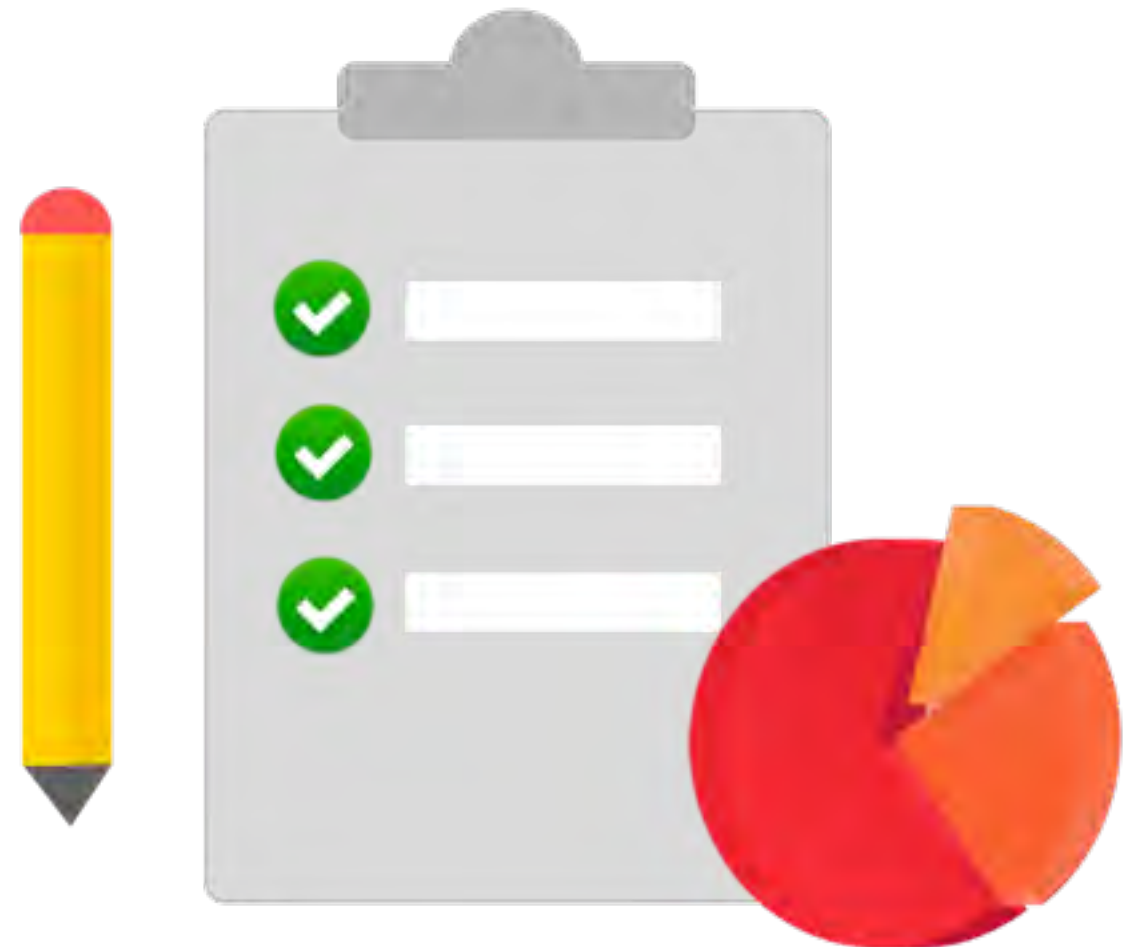
Prototypes Development

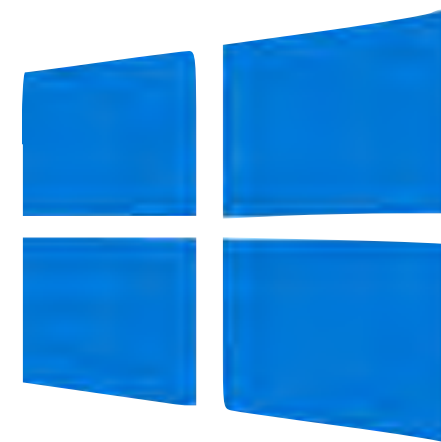


Train self-driving cars

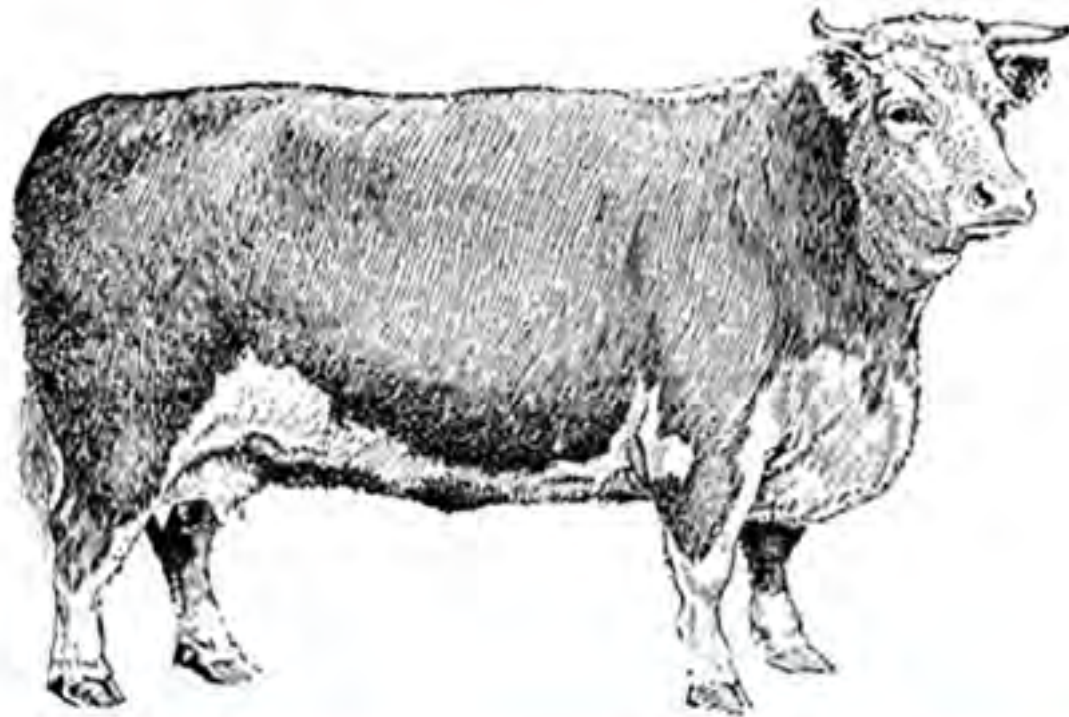


Implement test generators





No comments, no documentation but 20 tickets



The Guy Who
Wrote This Is Gone

It's running everywhere

Software can be chaotic, but we make it work



Expert

Trying Stuff
Until it Works



Public Final Event

You present/demo your prototypes

We present the results of the challenge

Format of the Seminar

- **Weekly** paper reading and summary
- **Weekly** presentation and active discussion
- Implementation of **two** prototypes
- **One** final public presentation/demonstration

Search-Based SE for Testing Autonomous Cars

**StudIP
5846HS**

- The seminar is open for Bachelor/Master
- Register on StudIP
- Registration follows the “Hollywood Principle”
 - You do not call us, we call you (**no FIFO**)

- Kick off meetings: 16.04.2020 - 23.04.2020
- Weekly Meeting: Thursday, 10:00 - 12:00

Time	Degree	Seminar	Chair	Presenter
18:17	M.Sc. Comp. Sci.	Topics in Deep Learning Algorithms for Autonomous Driving Applications	ITK Engineering GmbH, Dr. Stefan Held	--
18:22	B.Sc., M.Sc. Comp. Sci.	Search-Based SE for Testing Autonomous Cars	Software Engineering II, Prof. Dr. Gordon Fraser	Alessio Gambi
18:27	B.Sc., M.Sc. Comp. Sci.	Program Analysis for Dynamic Languages and Functional Languages	Software Engineering II, Prof. Dr. Gordon Fraser	N.N.

Program Analysis for Dynamic Languages and Functional Languages

- Chair of Software Engineering II
- Bachelor Comp Sci, Master Comp Sci
- Topics: Program analysis techniques for dynamic languages (JavaScript, Python, etc.) and functional languages (Haskell, Lisp, etc.)
- Kick-off meeting: 3.2.2020, 14:00, ITZ 252
- Mode: Presentation + Seminar Paper
- Registration via StudIP (HS5848)

Timeline

Time	Degree	Seminar	Chair	Presenter
18:32	M.Sc. Comp. Sci., M.Sc. MES	Modeling Smart Grid Systems and Services	Computer Networks and Computer Communications, Prof. Dr. de Meer	Philip Danner
18:37	Lehramt Gy, B.Sc. Math, Comp. Sci, & Internet Comp., M.Sc. Comp. Math. & Comp. Sci.	Angewandte Mathematik im Mathe-Museum (Skill.de)	Applied Mathematics, Prof. Dr. Brigitte Forster-Heinlein	--
18:42	B.Sc. Comp. Sci. & Internet Computing, M.Sc. Comp. Sci.	Cloud Computing	Security in Information Systems, Prof. Dr. Reiser	Philipp Eichhammer

Modeling Smart Grid Systems and Services

Exploring, Modeling and Analyzing Smart Grid Systems

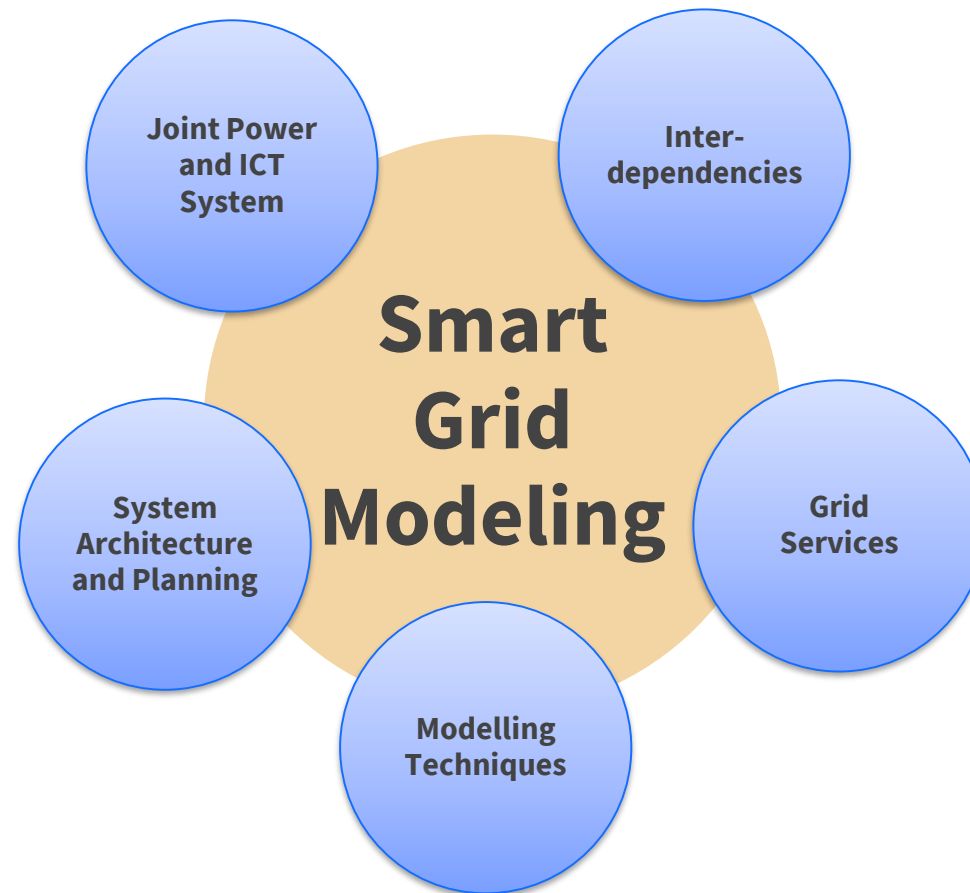


Amit Patil, Philip Danner, Prof. Hermann de Meer

Chair of Computer Networks and Computer Communications (CNACC)



- StudIP: 6008S
- Eligibility: MA Inf./MA MES
- ECTS points: 5
- The seminar goals:
 - Familiarize topics of current scientific research
 - Search and read scientific materials
 - Identify questions and solve them
 - Write scientific reports
 - Scientific presentation
 - Practical results
- Number of Topics: 10-12
- Strong recommendations:
 - Knowledge and interest in Power and ICT Systems
 - *Foundations of Energy Systems (formerly Computer Networks & Energy Systems) Lecture Participation*



- How can we select modeling techniques for a specific system?
- How can we quantify performance of our system from the model?
- What information can be embedded into the model?
- What information can be derived from the model?
- And finally, how can the metrics and models be used to enhance performance in interconnected systems?



- The seminar is organized as a block seminar
 - participants have to
 - prepare a paper,
 - present a short talk, and
 - review a paper



- **Registration in StudIP starts from 10.02, 12:00**
- **Kick-Off meeting and Topic Assignment: TBA (Beginning of March)**
- Order of topic assignment:
 - Personal Presence at the Kick-Off Meeting
 - First come – First Served
 - Order of registration in StudIP matters
 - Registration will be open on pre-announced date, see StudIP
- Topic Assignment during Kick-Off Meeting is binding



- **Amit Patil**
- Email: amit.patil@uni-passau.de
 - Room: ITZ 148
 - Telephone: +49(0)851/509-3029
- Philip Danner
- Email: philip.danner@uni-passau.de
 - Room: ITZ 148
 - Telephone: +49(0)851/509-3029
- The subject of all the emails should start with name of seminar



***Thank you for your attention!
Questions?***



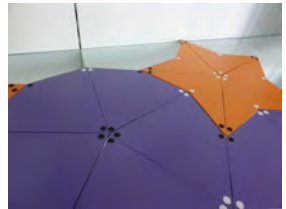
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Seminar: Angewandte Mathematik im Mathe-Museum (SKILL.de)

Prof. Dr. Brigitte Forster-Heinlein, Lena Bachl

Fakultät für Mathematik und Informatik, Universität Passau



Mathematik begreifen, am besten mit beiden Händen.

Passauer Mathe-Museum

- Besteht seit Dez 2012
- im Foyer des FIM-Gebäudes
- Öffentliche Dauer-Ausstellung
- Hands-On-Betrieb mit geschultem Personal für Schulklassen, Kindergärten, Lehrerfortbildungen, interessierte Bürger



Ziel des Seminars: Ausbau der angewandten Mathematik in unserem Passauer Mathe-Museum.

Zu erbringende Leistungen:

- Entwurf und Anfertigung eines Exponats
- Vortrag über das Exponat
- Kurze schriftliche Ausarbeitung

Zielgruppe: Seminar für Studierende

- im Mathematik-Lehramt
- in den Bachelorstudiengängen Mathematik, Informatik oder Internet Computing
- der Masterstudiengängen Informatik (Modulgruppe ITS) und Mathematik (Modulgruppe ANAT)

Stud.IP-Veranstaltung:

5759S Angewandte Mathematik im Mathe-Museum (SKILL.de)

Kontakt:

Brigitte.Forster@uni-passau.de

Lena.Bachl@uni-passau.de



Timeline

Time	Degree	Seminar	Chair	Presenter
18:32	M.Sc. Comp. Sci., M.Sc. MES	Modeling Smart Grid Systems and Services	Computer Networks and Computer Communications, Prof. Dr. de Meer	Philip Danner
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Cloud Computing

Summer Semester 2020

Prof. Hans P. Reiser, C. Berger, P. Eichhammer, J. Köstler

Assistant Professorship of Security in Information Systems
University of Passau

January 20, 2020

► Topics

- Distributed Systems, State Machine Replication, Distributed Consensus
- Edge-Computing, Cloud, Fog, Blockchain, IoT

► Language

- Seminar paper and presentation must be done in English

► Eligibility

- Mandatory seminar for Master Computer Science (no research seminar!)
- Seminar for Bachelor Computer Science or Internet Computing

► Seminar Form

- Conference seminar (practical work, paper submission, review process, conference presentation, camera-ready version)

▶ **Registration**

- ▶ Course 5888S (Bachelor) / 5889HS (Master) in Stud.IP

▶ **Topic Assignment**

- ▶ Stud.IP registration will be activated after the general faculty presentation
- ▶ You have to attend the topic assignment session
- ▶ Students can choose their topic according to their registration time in Stud.IP (first come, first served)

► **Contact**

- Prof. Hans P. Reiser (hr@sec.uni-passau.de)
- Christian Berger (cb@sec.uni-passau.de)
- Philipp Eichhammer (pe@sec.uni-passau.de)
- Johannes Köstler (jk@sec.uni-passau.de)

► Dates

- **22.04.2020** Topic Assignment (**14:00, tba**)
- **29.04.2020** Scientific Writing (**14:00, tba**)
- **18.06.2020** Paper Submission (**12:00, Online**)
- **25.06.2020** Review Submission (**12:00, Online**)
- **02.07.2020** Slides Submission (**12:00, Online**)
- **09 & 10.07.2020** Presentations (**tba**)

You must attend all presentations on both days!

- **31.08.2020** Final Paper Submission (**12:00, Online**)

► Information about rooms will be provided in Studip

► **Blockchain**

1. Applications for Hyperledger Fabric
2. Benchmarking Blockchains with Hyperledger Caliper

► **Internet of Things, Distributed Systems, Edge-Computing**

1. Resilient Edge Computing
2. Sensor Fusion and Fallback Mechanisms in IoT
3. Access Control in IoT
4. Failure Detectors in IoT

► **State Machine Replication, Distributed Consensus, Cloud**

1. Fault Injection into Replicated State Machines
2. Application-Level System Monitoring of Replicated State Machines
3. Attacks on Replicated State Machines

Interested in a topic? You can **Reserve** it

- ▶ Email to Supervisor and make a personal appointment
- ▶ Be there on the topic assignment day: **22/04/2020** at 14:00
- ▶ Assignment rule is: **first come, first served!**

- ▶ **Resilient Edge Computing**
 - ▶ How can we improve the resiliency of services that are executed in the edge?
 - ▶ You will explore a use case, e.g., that uses replicated gateways, sensor fusion or application specific fallback mechanisms.
- ▶ **Applications for Hyperledger Fabric**
 - ▶ Summarise which applications currently exist for HLF and analyze their application-specific requirements.
 - ▶ Set up an example application as an use case.
 - ▶ Does the modular design of HLF match these requirements? Reason about practical challenges from the developers' perspective!
- ▶ **Benchmarking Blockchains with Hyperledger Caliper**
 - ▶ Summarize recent efforts for evaluating blockchain performance.
 - ▶ Use the tool Hyperledger Caliper to benchmark a blockchain (e.g., HLF) in different environments and settings

Supervisor: Christian Berger (cb@sec.uni-passau.de)

All topics are based around the concept of a garden irrigation system and a weather balloon realized using an IoT Infrastructure

- ▶ **Sensor Fusion and Fallback Mechanisms in IoT**

- ▶ How can a faulty sensor be tolerated?
- ▶ Create concept for replicated sensors and fallback routines
- ▶ Implement your concept and execute small demo

- ▶ **Access Control in IoT**

- ▶ Summarize the techniques used for ensuring access control for IoT devices
- ▶ Select an AC framework or technique and implement a small demo application

- ▶ **Failure Detectors in IoT**

- ▶ Summarize which failure detector frameworks are currently available
- ▶ Analyze the detection performance of a chosen framework (e.g. ByzID, Falcon, etc.) when facing failures.

Supervisor: Philipp Eichhammer (pe@sec.uni-passau.de)

- ▶ **Fault Injection into Replicated State Machines**
 - ▶ Define the automated injection of different faults and attacks
 - ▶ Integrate those scenarios into an evaluation platform
- ▶ **Application-Level System Monitoring of Replicated State Machines**
 - ▶ Define an application-level monitoring strategy for replicated state machines
 - ▶ Implement this strategy into the BFT-SMaRt library
- ▶ **Attacks on Replicated State Machines**
 - ▶ Analyze possible attacks on replicated state machines
 - ▶ Specify an attacker model and perform a threat analysis

Supervisor: Johannes Köstler (jk@sec.uni-passau.de)