KuVS Newsletter

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KuVS Newsletter

Editor Message

Dear KuVS members,

we welcome you to the 21st edition of the KuVS newsletter.

This newsletter provides you with all information that you need to know about the KuVS community over the past six months. This edition features a summary on recent awards of KuVS members, finished PhD theses, project news, event reports, and some riddles from our dear colleague Rolf Windenberg.

More information and recent editions of our newsletter are available on https://www.kuvs.de/newsletter/.

We hope that you enjoy reading this edition of the KuVS newsletter. We as editors wish you a successful second half of 2025 filled with great results and interesting events, which we look forward to sharing in another exciting newsletter in six months.

We hope to meet many of you at NetSys in Ilmenau.

The newsletter editors,

Oliver Hohlfeld
University of Kassel

Bastian Bloessl
TU Darmstadt

KuVS Newsletter

KuVS Awards

Best Bachelor's Thesis of KuVS 2024
Shared award between

- Isabel von Stebut: "Resilience through Cross-Technology-Communication" (TU Berlin, Advisor: Falko Dressler)

  and

- Stefan Saxer: "Dataset Generation and Feature Extraction for High-Traffic Environment Personal Tracker Identification" (Universität Zürich, Advisor: Burkhard Stiller)

Best Master's Thesis of KuVS 2024
Shared award between

- Joël Braun: "Autonomous System Provider Authorization at IXPs" (TU Darmstadt, Advisor: Matthias Hollick)

  and

- Lisa Debus: "Decoding Media Modulation Sharply: A Reinforcement Learning-based Receiver" (TU Berlin, Advisor: Falko Dressler)

Best PhD Thesis of KuVS 2024

- Alexander Brundiers: "Taking the Shortcut – Enhancing Backbone Network Traffic Engineering with Segment Routing Midpoint Optimization" (Uni Osnabrück, Advisor Nils Aschenbruck)

KuVS Newsletter

Awards

Falko Dressler named ACM Fellow We congratulate Falko Dressler for being named ACM Fellow with the citation “For contributions to foundations of self-organization in wireless communication protocols in IoT and vehicular applications”.

https://www.acm.org/media-center/2025/january/fellows-2024

KuVS Newsletter

Event Reports

4th GI/ITG KuVS Workshop on Network Softwarization (NetSoft)

Michael Menth

The 4th GI/ITG KuVS Workshop on Network Softwarization (NetSoft) was organized by Sebastian Gallenmüller (TU Munich) and Michael Menth (Uni Tübingen) after editions in 2017, 2020, and 2022. It took place on April 3-4 2025 via Zoom.

The workshop featured 8 sessions with 31 presentations:

- Time-Sensitive Networking (TSN)
- 5G/6G Networking
- Software-Based Packet Processing
- P4
- IETF: Energy Efficiency and Evolution of MPLS
- New Hardware and Software for Data Plane Programming
- Network Monitoring and Measurement Tools
- Security

https://kn.inf.uni-tuebingen.de/kuvs-fg-netsoft/2025/program

The program included 20 original works and 11 invited talks. Seven minutes of extra time were allocated after each talk, which led to lively discussions due to the strong focus of the sessions. In addition to scientific results, new tools, teaching approaches, reports about new projects, IETF working groups, or mini-tutorials (MPLS Network Actions, SONiC) were presented. It turned out that many researchers are currently interested in testbeds for TSN networks. Therefore, a new mailing list has been provided to facilitate exchange on this topic: https://listserv.uni-tuebingen.de/mailman/listinfo/kuvs-tsn-testbeds

Intel Tofino is a popular ASIC for data plane programming. As it has reached its end of life, the first public announcement of the new P4-programmable ASIC ZenosIC Lanting was of particular interest for many researchers. Most slides and the accepted papers are available on the workshop website. Original works have been peer-reviewed and improved by a shepherding process if needed before being published by the TOBIAS-lib of the University of Tübingen. More than 100 participants were registered for the workshop and the sessions had 30-55 attendees, depending on the topic.

KuVS Newsletter

Finished PhD Theses

Johannes Zirngibl

Technical University of Munich (advisor Georg Carle)

Title: Detecting and Evaluating QUIC Deployments as Part of the Internet Ecosystem

Abstract:

The Internet is a complex ecosystem due to the interaction of various interdependent protocols and involved parties. Deploying new protocols needs to be done with care and further increases the overall complexity. With the standardization of QUIC, a new, fundamental network protocol was designed, which is expected to drastically influence the Internet ecosystem. QUIC challenges existing transport protocols, e.g., TCP but also unreliable transport. It directly integrates TLS and stream functionality and is designed as a general purpose protocol. This work provides tools to identify and evaluate QUIC. Furthermore, the work highlights properties of QUIC deployments and supported functionality within the Internet ecosystem. It relies on active measurement studies, which help to understand the ecosystem, changes, and future challenges. However, the complexity of the Internet prevents an isolated examination of QUIC deployments without consideration of other protocols. This work follows an active measurement approach and covers QUIC but also the IP layer and Domain Name System (DNS). In the first part of this thesis, we investigate IP measurements with a focus on IPv6. While full IPv4 address space scans are feasible, IPv6 scans can not easily be done. However, with the depletion of IPv4, the importance of IPv6 increases, and research has to consider it. With the IPv6 Hitlist, a vital tool to scan IPv6 was created. This work cleans the IPv6 Hitlist, analyzes its development, and improves its quality for future use. With the collection of new IP address sources and the application of IPv6 target generation algorithms, the number of responsive addresses within the hitlist was increased from 2.9M to 19.3M. In the second part of this thesis, we analyze the DNS ecosystem and new DNS resource records, namely SVCB and HTTPS. From our research perspective, these records are especially of value in the context of QUIC scans because they can be used to indicate within DNS that a service can be reached using QUIC. Furthermore, the impact of domain parking, a mechanism to monetize unused domains, was quantified. We showed that up to 30% of domains are parked. Domain parking affects new generic Top Level Domains (TLDs) but also popular TLDs, e.g., .com, and even top lists. Due to their limited value to normal Internet users, they should be treated differently in research and are not necessarily important for higher-layer protocol scans. In the third part of this thesis, we focus on QUIC. We provide tools to identify and evaluate QUIC deployments. We show widespread deployment of QUIC shortly before the release of RFC9000 in 2021 and an increase in the following years. Furthermore, our tools can identify used parameters and QUIC server libraries. The complexity of the protocol and the variety of implementations impact scans and tools, and proper testing and evaluation are required. We performed Internet-wide scans and identified at least one deployment for 18 QUIC libraries. The developed approach can identify

the libraries with 8.0M IPv4 and 2.5M IPv6 addresses. Our approach provides a comprehensive view of the landscape of competing QUIC libraries. In conclusion, we evaluated three significant parts of the Internet ecosystem, focusing on identifying and evaluating interesting QUIC deployments. However, our findings can also be generalized. They should be applied during scans of new protocols in the future besides QUIC: (i) While exhaustive IPv6 scans are still an unsolved task, the IPv6 Hitlist provides a good foundation for scans, and introduced improvements are essential for future research. (ii) The DNS ecosystem is an important source of information for the Internet ecosystem and can be used for scans. However, its value depends on the data quality and used domains. (iii) Scans for new protocols need to be done carefully, considering involved implementations and their interpretation of standards and thus, impact on scans. A good tool set to identify and analyze deployments is essential.

https://mediatum.ub.tum.de/1743772

KuVS Newsletter

Lars Wüstrich

Technical University of Munich (advisor Georg Carle)

Title: Securing Networked Systems by Identifying and Monitoring Multi-Layer Dependencies

Abstract:

Network activity always happens in order to provide a service to other processes. Examples are applications that exchange information with remote services, or central control units which instruct remote devices to execute actions. This creates a direct link between network activity and device activity on other layers, such as physical device state changes. We refer to this link as multi-layer relationship. As a result the network is a prime vantage point for monitoring distributed systems, e. g., to identify security incidents by monitoring multi-layer relationships. However, most monitoring tools, such as network intrusion detection systems, focus purely on information from individual layers. By lacking the ability to correlate events from multiple layers, the monitoring may fail to detect attacks or critical system states. This thesis explores mechanisms to secure networked systems by correlating events from the network and other layers. We introduce novel methods to identify abnormal system behavior via multi-layer event correlation. First we investigate which multi-layer relationships exist in computer networks. We analyze how applications influence network activity, and how control traffic implicates physical changes in the environment due to device activity. Afterward, we introduce methods to monitor these multi-layer relationships to identify abnormal device behavior. We use this approach to build accurate multi-layer models of device behavior in computer networks, describing expected system behavior. We focus on two multi-layer relationships linking network activity to events on other layers. First we investigate the relationship between application and network activity. Typically operating systems handle transmitting and receiving network traffic for applications. This separation of handling network traffic impedes the attribution of packets observed on a network interface to its causing application. Existing methods to create this association cause significant overhead or yield an incomplete data collection. We develop a novel method that efficiently associates packets to applications based on the extended Berkeley Packet Filter to address this issue. Based on this data collection, we introduce network application profiles that capture the typical network behavior of applications. We show that these profiles allow us to identify unusual application behavior causing abnormal communication activity. We also investigate the link between control traffic and physical activity of devices in network-controlled environments. We use this relationship to create a cyber-physical model that predicts physical changes in the environment based on observed control traffic. This allows anomaly detection in signals of composite side-channels in which multiple devices simultaneously influence physical measurements. Our approach addresses limitations of current side-channel monitoring methods, which often aim at monitoring isolated devices. The results from this thesis show that setting events from multiple layers into context enables advanced anomaly detection techniques. In particular, it allows the identification attacks and faults that cause inconsistent behavior on different layers. An example are covert attacks in which adversaries concurrently manipulate the input and output of devices to mislead the remote monitoring. The methods presented

in this thesis enable the development of advanced multilayer anomaly detection systems. Our approach allows to detect anomalies, which anomaly detection systems that only use one source of information fail to identify.

https://mediatum.ub.tum.de/1754233

KuVS Newsletter

Michael Peter Sober

TU Hamburg (advisor Stefan Schulte)

Title: Advancing Blockchain Interoperability: Protocols for Seamless Communication and Transactions Across Blockchain Networks

Abstract:

Missing interoperability is one of the major challenges limiting the application and innovation of blockchain technology. Many blockchain networks operate in isolation and cannot seamlessly interact with other blockchains. Consequently, users and applications are bound to a single blockchain ecosystem and cannot benefit from the recent advancements of the consistently evolving blockchain landscape. Unfortunately, existing blockchain interoperability solutions are resource-intensive or require tailored solutions for specific blockchains. Hence, there is a strong need to bridge the gaps between different blockchains by establishing lightweight and flexible solutions for cross-blockchain communication and creating application-level cross-blockchain protocols to foster a more connected and efficient blockchain landscape.

Therefore, this thesis presents our recent advances in blockchain interoperability, including novel approaches for cross-blockchain communication, token transfers, and smart contract calls. We propose two cross-blockchain oracles with different off-chain aggregation mechanisms based on threshold signatures and zk-SNARKs. Additionally, we integrate blockchain technology directly into a Distributed Key Generation protocol to improve transparency and add accountability and crypto-economic incentives to encourage honest behavior. Further, we present two cross-blockchain token transfer protocols operating on different blockchain layers and introduce a framework for asynchronous cross-blockchain smart contract calls providing the foundation for cross-blockchain decentralized applications.

KuVS Newsletter

Benjamin Becker

Technische Universität Darmstadt (advisor: Ralf Steinmetz)

Title: Soft Real-Time Communication in Challenging Environments - Wireless Ad Hoc Communications for Post-Disaster Networks with Low Traffic Load and No Mobility

Abstract:

Communication networks are considered play a central role in many aspects of life. However, the infrastructure is fragile and can be significantly damaged by natural disasters, as events have shown in the past. In times of crisis, a functioning communication infrastructure is essential. Immediate post-disaster measures, such as coordinating rescue operations, assessing the situation, and placing emergency calls, all rely on communication. Moreover, communication networks remain essential throughout the recovery from a disaster.

Post-disaster networks must support a wide range of applications quickly and efficiently. They typically need to be deployed very quickly in crisis areas, relying on a variety of wireless technologies connecting end-devices in an ad hoc manner. Several applications depend on real-time communication, such as emergency calls or the control of rescue and monitoring robots. However, existing approaches for real-time communication often place high demands on networks and are therefore unsuitable for the challenging conditions of crisis scenarios. In this thesis, a decentralized approach is presented to provide soft real-time guarantees for data transmission in wireless ad hoc networks. First, an analysis of individual links is conducted to understand how the distributions of delays for individual links are formed. An extensive measurement study of a common network protocol designed for microcontrollers is conducted. Analyzing the data collected in these experiments enables the development of a model that accurately reconstructs observed distributions of link delay with a limited parameter set. These findings about link delays form the basis of a probabilistic network model that allows to predict the distribution of delays of a communication path. This enables performance predictions about the of real-time data across the entire network. Building on this model, a distributed algorithm is introduced to calculate real-time traffic performance across the network. Using this performance data, a routing algorithm is developed that achieves provably optimal routing for real-time data.

To evaluate these algorithms, a network simulator for wireless sensor networks was adapted, allowing the modeling of a wide range of realistic scenarios, including sudden traffic bursts and diverse channel conditions. A routing protocol integrating the developed algorithms is then designed and implemented. This protocol can be understood as a probabilistic variant of a distance-vector-based protocol.

In all simulated scenarios, the approach outperforms classical, non-probabilistic distance-vector protocols. The performance differences are especially pronounced in challenging scenarios such as high network load, uncertain channel conditions, or very tight packet deadlines. The contributions of this dissertation thus demonstrate the viability of probabilistic approaches for providing soft real-time guarantees in challenging network environments.

KuVS Newsletter

Olga Kondrateva

Technische Universität Darmstadt (advisor: Björn Scheuermann)

Title: Efficient Communication for Data-intensive Applications in Small Satellite Networks

Abstract:

The importance of timely analysis of Earth observation data can hardly be overestimated. The ever-growing demand for it in many areas, such as climate monitoring and disaster management, has encouraged rapid advances of satellite technologies. As a result, the amount of satellite data has grown significantly. Meanwhile, small satellites have gained popularity in the space industry. While enabling fast and low-cost development of space missions, their use constrains the download rates due to energy and antenna size restrictions as well as limited communication opportunities with Earth. This creates a fundamental gap between growing data generation rates and downlink capacities, which increase at a much slower pace. We cannot expect this gap to be soon eliminated by the advances in communication technologies. In this thesis, we systematically explore the scope of solutions that allow to mitigate this problem, which we divide into two main categories. The first category includes techniques approaching the problem in a distributed manner. For instance, multiple satellites can be introduced to deal with energy limitations and intermittent connectivity. The second category comprises solutions that aim to reduce the communication demand by processing the data onboard. In particular, we consider the use of artificial intelligence techniques, such as neural networks, for compression and image classification. To contribute to the first category, we focus on optimization techniques that allow to efficiently deal with satellite mobility. We formulate an optimization program that models communication in a small satellite constellation. We identify computation complexity as one of the main limiting factors of this approach. To address this challenge, we propose a decomposition approach allowing to efficiently solve such optimization problems by parallelizing computations. Our contribution to the second category is twofold. First, to dynamically address the challenges arising in small satellite networks, we combine data compression and communication. To this end, we leverage artificial intelligence and introduce joint source-channel coding using neural networks for small satellite communication. We also consider how variability of channel conditions that is typical for small satellite networks can be taken into account with low overhead. Second, while neural networks can provide effective solutions for onboard processing, we identify the limited opportunities for updating them from Earth as an important issue. To allow for early deployment of updated neural network models even in the case of partially missing parameters, we develop communication protocols, enabling incremental updates of neural networks.

KuVS Newsletter

Christoph Döpmann

Technische Universität Berlin (advisor: Florian Tschorsch)

Title: On the Evolution of Onion Routing Networks

Abstract:

The desire for anonymous communication has been an integral part of the digital society since the early approaches many decades ago. Today, anonymous Internet communication is more relevant than ever. At the same time, it is confronted with significant new challenges: On the one hand, better performance is needed in order to provide acceptable usability to a growing number of users transferring growing amounts of data. On the other hand, however, anonymity requirements are growing too, as Internet users are facing stronger adversaries. Anonymous communication networks (ACNs) will have to adapt to these demands in order to continue providing online privacy to Internet users in the future. Therefore, evolution of ACNs is a core theme that is central to the future development of anonymous communication.

Our work thus constitutes a thorough investigation of the evolution of ACNs necessary to keep pace with the changing demands of modern online communication, specifically concerning performance and anonymity. Having in mind the real-world significance of the topic, we focus particularly on onion routing networks such as Tor, the most prominent anonymity system as of today. In essence, we analyze what can be changed to improve performance and anonymity, how such changes can be carried out, and in particular what would be the consequences thereof. In doing so, we investigate the two fundamental dimensions that enable evolution of distributed systems: Firstly, changes to the network protocols, such as on the transport layer, and secondly, changes to the network infrastructure, e.g., by adding resources.

Throughout this work, we contribute answers to a number of research questions that all revolve around the evolution of onion routing networks for improving performance and anonymity. Having in mind the inherent trade-off between performance and anonymity, a special focus is put on the relationship between these two design goals. All of our contributions aim to either establish a more thorough understanding of evolution in ACNs in general, investigate the trade-off between performance and anonymity, or contribute concrete, practically relevant improvements. Our results range from a novel experimental transport protocol for the Tor network that is the first to explore the suitability of model predictive control to improve performance, to concrete insights on how topological properties of network growth influence the achieved level of anonymity. Our work therefore constitutes an important step towards evolving modern anonymity networks in a way that enables them to keep up with future demands regarding performance and anonymity.

KuVS Newsletter

Alexander Willecke

TU Braunschweig (advisor Lars Wolf)

Title: On Information Availability and Scalability of Collective Perception

Abstract:

The Cooperative-Intelligent Transportation System (C-ITS) will be a key technology for increasing traffic efficiency and safety in Europe. In this system, connected road users exchange ego-state and context information via direct communication to enhance awareness of the traffic situation. For raising awareness of non-connected road users, such as legacy cars and pedestrians, Collective Perception (CP) is essential. With CP, stations exchange data about objects perceived with their onboard sensors via direct communication, enhancing the receiver's perception and situational awareness. While a rising Market Penetration Rate (MPR) increases awareness for connected and non-connected road users, it also increases the computational and communication requirements of CP. This thesis investigates the Object Inclusion Rules that define when object data shall be sent in terms of awareness under consideration of a rising MPR. Also, the impact of the sender's perspective on the awareness and the completeness of transmitted object information is analyzed.

Furthermore, the usage of communication and computation resources for transmitting object data and forming a holistic view of the environment at the receiver side is evaluated. Finally, approaches to reduce the computational requirements for CP are proposed and evaluated. It was found that deploying CP on a large scale can significantly improve awareness, especially for Vulnerable Road Users, enabling an increased awareness horizon for drivers and assistance systems and, thus, improving traffic safety. For sharing perception, it was shown that a significant amount of the available communication and computational resources are necessary if the MPR rises. The Object Inclusion Rate Control methods proved effective in reducing communication resource requirements, and requirements for computational resources could be reduced considerably and to a constant level by filtering for relevance and quality.

KuVS Newsletter

Thomas Blumauer-Hießl

TU Wien (advisor Stefan Schulte)

Title: Federated Learning Systems in the Industrial Internet of Things

Abstract:

In the Industrial Internet of Things (IIoT), a multitude of sensors and devices deliver data from machines and production processes. Applying data analysis and trained Machine Learning (ML) models on the data provides insightful information for optimizing the processes and therefore increasing productivity. With the rise of Federated Learning (FL), decentralized devices are enabled to collaboratively train ML models without sharing data. For this, a server aggregates (i.e., averages) the model updates delivered by devices. This approach preserves privacy of the local clients and offers the potential to boost the performance of ML models, since knowledge is shared between involved FL participants without revealing raw data.

The application of FL in industry and the development of holistic FL systems for industrial clients still face open issues. In particular, there is a need for providing tools and services to develop, deploy, and run FL solutions and integrate them into industry applications. Due to the diverse setup of individual devices and variations in underlying processes and monitored machines, the collected data often follows heterogeneous data distributions as well. Consequently, the training of a global model through averaging can result in insufficient model quality. Another problem is the optimal deployment of clients and their selection for FL runs. Essentially, it is crucial for efficient FL systems to minimize the response time and boost the performance of the model. Furthermore, there is still a gap to integrate FL solutions into business and manufacturing processes, since there is only limited information on practical implementation guidelines available for industry.

This thesis presents systems and concepts that provide FL services to clients in the IIoT considering strategies for optimizing models towards individual data distributions. We support FL activities along the whole lifecycle from development to application integration. To optimize deployments of FL solutions, we present approaches for client placement and selection for FL clients by the server. For this, we consider edge, fog, and cloud platforms. Finally, we survey the prerequisites and requirements for FL solutions in practice and collect respective pain points to derive suitable FL blueprints for industrial collaboration.

We evaluate the FL system(s) and proposed algorithms on industrial data from decentralized data sources and show improvements in the performances of the trained FL models as compared to isolated local ML and plain FL. The results of our deployment and client selection optimization demonstrate flexibility and convergence to the relatively best platform for FL clients aiming for optimizing e.g., model performance and response time. Our FL blueprints address the surveyed pain points of 13 companies and provide architectures for solving identified Artificial Intelligence (AI) problems with FL.

KuVS Newsletter

KuVS Calls and Announcements

In this section, you find an overview on calls for papers and participation in the german-speaking area.

NetSys 2025

International Conference on Networked Systems 2025

1–4 September 2025
Ilmenau, Germany

https://kuvs.de/netsys/2025

The 1st Workshop on Resilient Networks and Systems (ReNeSys 2025)

(in conjunction with NetSys 2025)

1 September, 2025
Ilmenau, Germany
https://www.resilient-worlds.org/renesys/

3rd International Workshop on Machine Learning in Networking (MaLeNe 2025)

(in conjunction with NetSys 2025)

1 September, 2025
Ilmenau, Germany

https://www.uni-augsburg.de/en/fakultaet/fai/informatik/prof/netcom/events/malene2025/

KuVS Fachgespräch and VDE ITG KT2 Workshop

Call for Participation

Würzburg Workshop on 6G Networks (WueWoWAS'25)

The Würzburg Workshop on Next-Generation Communication Networks (WueWoWAS'25) focuses on preliminary and ongoing research and previously published hot topic papers on next-generation communication networks. The central theme is 6G networks, covering advanced architectures, technologies, and concepts that will enable the next generation of connectivity, intelligence, and automation across multiple domains. General topics include but are not limited to

- **6G architectures and technologies**: converged and non-terrestrial networks, specialized networks e.g. industrial, IoT, lower power wide area networks, integrated communication and sensing, joint computation and communication, end-to-end perspective, etc.
- **Enablers and concepts for 6G networks**: softwarization, edge computing, (explainable) AI and ML, automation, large language models (LLMs), real-time and time-sensitive networking (TSN), etc.
- **6G use cases**: critical infrastructures, industrial manufacturing, robotics, automotive, smart city, public safety, power and communication networks, healthcare, remote assistance, meta verse and network worlds, etc.
- **Evaluation and quantification**: measurements, modeling, simulation, analysis on QoS, QoE, sustainability, energy efficiency, resilience, etc. as well as tradeoffs; interdependency evaluation, e.g. between power and communication networks, edge and cloud computing, wired and wireless connectivity, centralized and distributed architectures, etc.
- **Evaluation platforms and tools**: open-source software for simulation and prototyping, useful tools and software frameworks, workflows for testbeds, reproducibility frameworks and benchmarking methodologies

The workshop will take place in-person in Würzburg, Germany on 6 -8 October 2025. We encourage PhD students, early career scientists as well as senior researchers to contribute early state and ongoing research or previously published hot topic papers in the form of extended abstracts no longer than 3 pages, with 1 additional page for references. The goal of the workshop is to foster communication among researchers from industry and academia.

Program Overview

The program will include regular presentation sessions with ample time for questions and discussion. We will organize a **speedmentoring** session with invited experts from academia and industry. The workshop will start on Monday morning and finish Tuesday afternoon. Wednesday is organized as a PhD Day, tutorial-style talks, and (hands-on) experience sessions.

- Monday: **technical sessions, social event**
- Tuesday: **technical sessions, come-together**
- Wednesday: **PhD day** with the following topics

  Introduction to Quantum Communication using Computer Science and Performance Evaluation (Karim Elsayed, Univ. Hannover)
  Energy Measurements, Metrics, Models (Frank Loh, Tobias Hoßfeld, Univ. Würzburg)
  Open RAN and 5G Campus Networks Setup & Measurements (Stanislav Lange, NTNU Trondheim)
  Resilience and Sovereignty Metrics and Models (Carmen Mas Machuca, UniBw München)

Workshop Date
6 – 8 October 2025

Submission Deadline
11 July 2025

Acceptance Notification
31 July 2025

Registration Deadline
31 August 2025

Workshop Website
https://lsinfo3.github.io/WueWoWAS2025/

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GI/ITG KuVS "Communication and Distributed Systems"

VDE ITG

KuVS Communication and Distributed Systems

GESELLSCHAFT FÜR INFORMATIK

– CALL FOR PAPERS –

Programmkomitee

Thomas Hänel (Uni Osnabrück)
Florian Klingler (TU Ilmenau)
Silvia Krug (Mid Sweden University)
Ulf Kulau (TU Hamburg)
Krzysztof Piotrowski (BTU Cottbus and Leibniz Institute for High Performance Microelectronics)
Thomas Scheffler (HTW Berlin)
Jan Schlichter (TU Braunschweig)
Daniel Szafranski (TU Clausthal)

Organisationskomitee

Prof. Dr.-Ing. Andreas Reinhardt
Daniel Szafranski, M.Sc.
Chingiz Seyidbayli, M.Sc.

Kontakt

fgsn2025@tu-clausthal.de

Wichtige Termine

Einreichungsfrist:	20. Juni 2025
Benachrichtigung:	1. August 2025
Finales Paper:	22. August 2025

Einreichung

Weitere Informationen zur Einreichung unter www.ifi.tu-clausthal.de/fgsn2025

Tagungsort

CUTEC-Zentrum (Raum M 2.31)
Leibnizstr. 23
38678 Clausthal-Zellerfeld

Fachgespräch Sensornetze (FGSN)

Drahtlose Sensornetze sind eine effiziente und vielseitige Technologie. Die Einsatzbereiche sind weit gestreut und umfassen Anwendungen wie das Internet der Dinge (IoT), Smart Cities oder das Monitoring von Umweltparametern.

Die drahtlose Kommunikation der Sensoren ermöglicht dabei einerseits den Einsatz in abgelegenen Gegenden sowie andererseits die einfache Erweiterbarkeit der Netze. Zu den Herausforderungen drahtloser Sensornetzwerke gehören unter anderem der Einsatz in rauen Umweltbedingungen, variable Linkqualität, Energieeffizienz, Skalierbarkeit sowie die Wahl geeigneter Kommunikationstechnologien. Das Ziel des FGSN ist es, einen wissenschaftlichen Austausch zu Entwurf, Implementierung, Datenverarbeitung sowie weiteren verwandten Themen im Kontext der drahtlosen Sensornetze zu ermöglichen.

Es können Extended Abstracts mit einer Gesamtlänge von bis zu 4 Seiten (inklusive Literaturverzeichnis) eingereicht werden. Die Einreichungen müssen im zweispaltigen IEEE-Format formatiert werden. Beiträge können sowohl in deutscher als auch in englischer Sprache eingereicht werden.

Im Anschluss an die Konferenz werden die Proceedings veröffentlicht. Falls gewünscht, kann auf Wunsch auch nur ein Short Abstract veröffentlicht werden. Diese Option kann sinnvoll sein, falls geplant ist, das Paper bei einer zukünftigen Konferenz oder einem Journal einzureichen.

Mögliche Themen beinhalten:

- Entwurf und Konzeption von drahtlosen Sensornetzen
- Kommunikationstechnologien und Protokolle
- Datenanalyse und Big Data in drahtlosen Sensornetzen
- Energieeffizienz und Energy Harvesting
- IoT und Cyber-Physische Systeme
- Sicherheit und Datenschutz
- Skalierbarkeit und Robustheit von Sensornetzen
- Leistungsbewertung drahtloser Sensornetze
- Simulationsumgebungen und -tools
- Erfahrungen mit dem Praxiseinsatz von Sensornetzen

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TU Clausthal

KuVS Newsletter

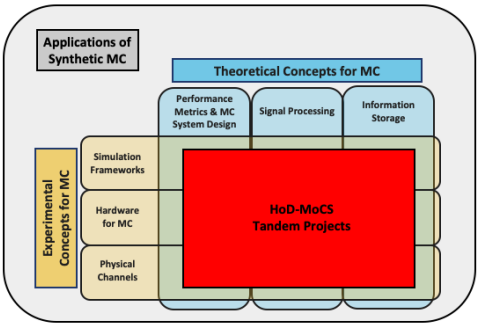
Project News

New DFG Priority Programme 2526

Holistic Design of Molecular Communication Systems (HoD-MoCS)

Program Committee:

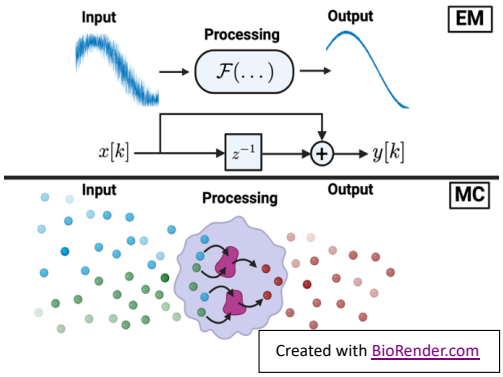
- Prof. Dr.-Ing. Robert Schober (coordinator)
- Prof. Dr.-Ing. Dr. rer. nat. Holger Boche
- Prof. Dr. rer. nat. Kathrin Castiglione
- Prof. Dr.-Ing. habil. Falko Dressler
- Prof. Dr. rer. nat. Silke Härteis



Summary:

Practically all existing technical communication systems and almost all of the related ongoing research employ electromagnetic (EM) waves for information transmission. However, as successful as this technology has been, it may not be suitable for applications that require micro-scale transceivers, communication in liquid media, and interfacing with biological systems. On the other hand, natural communication processes (e.g., intra-cellular communication, cell-to-cell communication, insect communication), which are often based on the exchange of molecules, operate over different scales, in both gaseous and liquid media, and can connect different biological entities. This has motivated communication engineers to investigate the possibility of exploiting molecular communication (MC) for technical purposes and has led to the emergence of a new field of research - synthetic MC. The vision of disruptive, non-conventional, and diverse applications, including the Internet of BioNanoThings (IoBNT), targeted drug delivery, pest control, plant engineering, and immersive reality, has led to a steady increase in research activity in Germany and internationally over the past few years.

However, despite the huge promise that synthetic MC holds, progress towards these applications has been comparatively slow as communication engineers generally do not possess the expertise and skills needed to design synthetic MC hardware (e.g., artificial cells, nanodevices) and to conduct experiments in relevant environments (e.g., vascular systems, plants, bioreactors) nor do they have the required application domain knowledge



(e.g., agriculture, bio-chemical engineering, medicine). To overcome this gap in expertise and the resulting scientific limitations, a concerted wide-ranging interdisciplinary research program is needed. This is the motivation for the DFG Priority Program (PP) "Holistic Design of Molecular Communication Systems (HoD-MoCS)", which aims to build an interdisciplinary `national network of excellence on synthetic MC comprising tandem teams consisting of communication engineers, contributing the required expertise in communication, networking, signal processing, and information theory, and researchers from complementary disciplines (e.g., agriculture, bio-chemical engineering, biology, chemistry, medicine, neuroscience, pharmacy), contributing the expertise required for MC hardware and experiment design as well as application relevance. The collective interdisciplinary expertise of the participants will allow HoD-MoCS to tackle the numerous theoretical, experimental, and application-related challenges arising in synthetic MC design in a holistic manner, which is indispensable for achieving significant progress in this emerging field. HoD-MoCS will address highly innovative and fundamental research questions regarding performance metrics, signal processing, information storage, simulation frameworks, hardware design, physical channels, and applications for synthetic MC systems, thereby moving the emerging field a significant step forward towards knowledge transfer and ultimately products and commercialization.

HoD-MoCS will be the first interdisciplinary national network of excellence on synthetic MC world-wide. The proposed holistic approach, the originality of the considered research questions, and the various supporting measures deployed to facilitate efficient interdisciplinary collaboration, cross-disciplinary training, national and international networking, and research data sharing, will ensure that HoD-MoCS has a lasting impact on synthetic MC research and establish Germany as an international leader in this emerging field.

Call for proposals:

- will be published shortly

KuVS Newsletter

Fun

How 2 Shor10 English Texts

Riddles Based on a "Mathematically Oriented Reform" of English Orthography

Rolf Windenberg (alias: Nigel Fred Brown)

The Rules:

1. Usage of mathematical symbols and of numbers
2. Capital letters are pronounced as in the alphabet

Examples:

(Trafalgar)^2 [meaning: Trafalgar Square]

$\sqrt{66}$ [meaning: Route 66]

Y R U so Z 2dA ? [meaning: why are you so sad today ?]

The Riddles *(Solutions, see on next page)*:

- *Beginners:* **O, V shouldn't B so Z**
- *Playing with Capital Letters:* **NME**
- *Advanced Persons:*
  his 4h+ in 10nis |was| lE gr8
- *Experts:*
  @ (T • + ra) ∀ways 0d 2 drink grEn T + 2 (Et + cake)
  [hints: @ pronounced „at" *and*
  0 pronounced "love" (as in tennis)]
- *Geniuses:*
  I C 1derful h@s + buy ¼ elma

Fig. 1: Illustration to assist the reader in solving the fifth riddle (source: [1])

[1] Windenberg, R., Hasselfang, R.W.: How 2 Shor10 English Texts. Shaker Media Verlag, Düren, ISBN 978-3-95631-590-9, 2017

Solutions of the riddles (by Rolf Windenberg):

- Oh, we shouldn't be so sad [because: *O, V*-shouldn't-*B*-so-*Z*]
- enemy [because: *N*-*M*-*E*]
- his forehand in tennis was absolutely great [because: his-*four*-h-*and*-in-*ten*-nis-was-*absolute*-l-*E*-gr-*eight*]
- at tea time Sandra always loved to drink green tea and to eat some cake [because: *@*-*T*-*time.s*-*and*-ra-*all*-ways-*love*-d-*two*-drink-gr-*E*-n-*T*-*and*-*two*-*E*-t-*sum*-*cake*]
- I see wonderful hats and buy one for Thelma [because: *I*-*C*-*one*-derful-h-*@*-s-*and*-buy-*one four.th*-elma].

KuVS Newsletter

Next Newsletter - Deadline November 15th

Next newsletter : 12/2025

Deadline for submissions and contributions : 15th November 2025

We ask you for submissions in English. Topics can be from the following time frame: June 2025 - December 2025

- Fachgruppe KuVS
  - Geschäftsberichte der GI – KuVS – Fachgruppe
  - ...
- News from the working groups
  - Dissertations
  - Awards
  - News form persons
  - Open positions
  - ...
- New projects (DFG, BMBF, KMU, etc.)
  - Initiatives
  - Larger projects
  - ...
- Calls and news from events, conferences, etc.
  - Reports (Conferences, workshops, Fachgespräche, Dagstuhl, doctoral summer/winter schools, ...)
  - Call for papers and participation
    (conferences (supported by or hosted in Germany/Austria/Switzerland), Fachgespräche, Summer Schools, ...)
  - Fun
  - ...
- Announcements and important dates

The preferred submission format is text, e.g., using markdown language. Call for papers can also be submitted as PDFs.

Submissions should be done by sending emails to the editors:

Oliver Hohlfeld Bastian Bloessl

mailto:oliver.hohlfeld@uni-kassel.de mailto:mail@bastibl.net