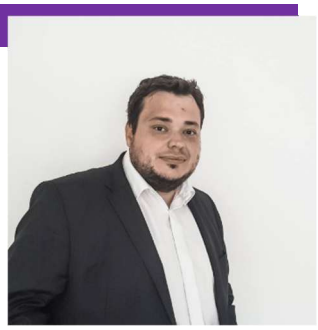
Curriculum Vitae



Univ.-Ass. Dipl.-Ing. Kurt Klaus Horvath, BSc

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Professional:

University Assistant | University of Klagenfurt **03/2023 –**

Research in the area of 'Service Discovery' to make distributed services in the Cloud Continuum accessible to users. Special attention is given here to mobile access networks. Service discovery should be active from different access networks and optimized to take into account the position of the user. One of the key indicators here is the latency required for the user to identify a service instance. To evaluate the access networks, the Ripe-Atlas Probe network is used. Development of Service orchestration methods for resource optimization.

In addition to research activities, I am involved in teaching and administrative topics at the Institute of Information Technology. I am also involved in the 'Kärnten FOG' project to evaluate regional use-cases to be optimized using FOG computing.

Technology: Python 3, Go, Google Cloud (GC), AWS, Microsoft Azure, 4G, 5G, 6G

Senior Researcher | FH Kärnten (CUAS) – 5G Playground Carinthia **05/2021 – 02/2023**

Research in the area of 5G networks and their utility in the context of SmartCity applications. Development of use cases to apply artificial intelligence for traffic applications. The main focus is on traffic safety, with special attention to the low latency of 5G. In the course of this evaluation, a generic framework was created which provides different SLAs for users. This framework will be published under the working title 'Adaptive Streamer Framework'. Apart from dynamic traffic scenarios, static scenarios for SmartCities are also considered (example: parking occupation optimization).

Technology: Python 3, C++20, Go ,Boost, Poco, Google Cloud (GC), AWS, Microsoft Azure, 4G, 5G

Software Engineer – A-tron.3d | GC Dental **01/2018 – 04/2021**

Extension of the stereo matching engine to get depth data of objects. Design and implementation of "Plug & Play" functionality to disconnect camera hardware from the GUI (Qt) during operation or to perform a dynamic reinitialization. Edge detection on a half-edge mesh to define preperation edges of dental implants (CGAL, Eigen). Interface definition with external cooperation partners (REST). Development of a server backend to process data in real time from key users (statistics). Furthermore I was responsible for the administration of the cloud services at GC.

Technology: C, C++14, C++17, Go ,Boost, Qt5, OpenMesh, CGAL, Docker, Azure Cloud, AWS S3, AWS Lambda, AWS EC2, AWS ECR, AWS RDS

Founder – FLX | Logistic Solutions **05/2017 – 10/2022**

Design and implementation of cloud based software solutions. The focus is on a microservice architecture to process large amounts of data in real time. This includes services for tracking drivers as well as the implementation of user interfaces for the end customer. The solution is completed by a routing engine that can manage multiple routes/drivers/depots in near real-time.

Technology: AWS Lambda, AWS EC2, AWS RDS, Docker, Jhipster, Go, NodeJS, PostgreSQL, MariaDB, NoSQL (Amazon DynamoDB, Cassandra, Redis)

Software Engineer - Kapsch TrafficCom AG **09/2011 – 12/2018**

Development of software components (Windows Services) in the area of the central system. Extension and further development of a server application which enables the communication of the central system with the end devices in the vehicles. This component serves as an interface to the on-board unit that exchanges ASN-1 coded messages via UDP and uses the Oracle OCCI client for data exchange with the database.

At the same time I was responsible for the implementation of a so called Rating Engine. This engine collects toll relevant transactions and evaluates them in form of different toll objects. Based on the toll objects the amount to be paid is then determined by a second service implemented by me.

These Windows services were implemented in C++ using the STL, BOOST and Poco libraries in cooperation with Kapsch development teams in Sweden and Argentina. The focus in these projects was on high availability and scalability while always ensuring data integrity.

Since mid-2014, I have also been part of a group within Kapsch that is evaluating new technologies such as RabbitMQ, Redis, Google Go

Technology: C, C++, Go, Poco, Boost, Ansible, Cassandra

EADS | Dornier Consulting Automotive – Internship **01/2009 – 06/2009**

Evaluation and prototype implementation of character recognition (OCR) solutions. Prototypes were implemented in LabView and C# using different frameworks for image processing. The prototypes were tested and evaluated for automatic testing of vehicle fittings.

Technology: C++, C#, LabView

Teaching

Lecturer (internal) | University of Klagenfurt **03/2023 –**

Course**: Operating Systems** - Lab (Group 1 and 2) (3 SWS, 4 ECTS, SS24, SS25)

Course content:
- Design of operating systems
- Process Design
- Concurrency
- Devices
- Kernel Programming
- Filesystem
- System calls

Course**: Advanced Topics in C++** - Seminar (2 SWS, 2 ECTS, WS24/25)

Course content:
- Classes/Structs/Unions
- Functions and Function Objects
- Concurrency
- Advanced datatypes (auto, variant, optional)
- Lambda Functions
- Algorithm Lib
- Container (vector, list, map, array)
- Templates
- GUI integration

Part-time lecturer (external) | Carinthia University of Applied Science **10/2019 - 02/2021**

Course**: Distributed Systems** - 1. Semester (3 SWS, 4 ECTS, WS19, WS20)

Course content:
- Goals of distributed systems
- Types of distributed systems
- Architecture - System Architecture
- middleware
- Processes, threads and tasks
- Remote Procedure Call
- Message-oriented communication
- Stream-oriented Communication
- Consistency and Replication

The goal of the course is to get to know theoretical aspects of distributed systems including practical exercises.

Lecturer (internal) | Carinthia University of Applied Science **05/2021 – 02/2023**
Courses:

Current IT Trends (VO, 2 SWS, 3 ECTS, SS22)
Subject: Cloud Services

Master Thesis (MT, 0.5 SWS, 20 ECTS, SS22)
Student: Kenneth Nsafoa-Yeboah

Master Project (PW, 0.3 SWS, 5 ECTS, WS21/WS22)
Student: Tim Pirtscher
Kenneth Nsafoa-Yeboah

Cloud & Edge Computing (ILV, 3.5 SWS, 5 ECTS, WS22)
Course content:
- Differentiation CLOUD/FOG/EDGE
- Architecture - System Architecture
- Service-oriented Design
- Function as a Service (FAAS)
- Persistence Models in the Cloud
- Containerization
- DevOPS for Cloud-Native Applications

Education:

University of Klagenfurt **02/2022 –**
Doctoral studies
Doctorate of Technical Sciences (Dr. techn.)(PhD.)

Carinthia University of Applied Science, Klagenfurt **10/2009 – 06/2011**
Master, Communication Engineering for IT
Master of Science/Diplomingenieur (Dipl.-Ing.)

Carinthia University of Applied Science, Klagenfurt **10/2006 – 06/2009**
Telematics & network technology (specialization: automation technology)
Bachelor of Science in Engineering (BSc)

HTBL (Federal Technical College) Pinkafeld (Austria **09/2000 – 06/2006**
Mechanical Engineering – Specialization building-services engineering

Fellowship:

University of Salzburg - Research fellowship **01/2010 – 04/2011**

Research in the field of iris recognition systems and data compression. Explicitly, the influence of JPEG-XR and other lossless compression methods on the recognition rate was investigated. In summary, better results can be achieved with lossy compression than with lossless compression. Furthermore, recognition rate can be optimized for adaptive quantization of different frequency bands.

Supervisor:
Univ.-Doz. Dr. Andreas Uhl

Publications:

Current research:

6G Infrastructures for Edge AI: An Analytical Perspective
K Horvath, S Tuda, B Idrizi, S Kitanov, F Doko, D Kimovski
IPDPS 2025 (Intel4EC Workshop proceedings)

SEAL-CC: Scalable Latency Evaluation Methodology for Internet-of-Things Services
K Horvath, D Kimovski, R Prodan, B Spiess, O Hohlfeld
IoT '24: Proceedings of the 13th International Conference on the Internet of Things

MESDD: A Distributed Geofence-based Discovery Method for the Computing Continuum
Kurt Horvath, Dragi Kimovski, Christoph Uran, Radu Prodan, Helmut Wöllik
Euro-Par 2023: Parallel Processing, 29th International Conference on Parallel and Distributed Computing

Geofence-Based Service Discovery in the Computing Continuum
Kurt Horvath, Dragi Kimovski, Christoph Uran, Radu Prodan, Helmut Wöllik
2022 IEEE/ACM 15th International Conference on Utility and Cloud Computing (UCC)

Location-Based Service Discovery for Edge Computing Using DNS
Kurt Horvath, Helmut Wöllik, Uran Christoph, Valentin Egger
Proceedings of Seventh International Congress on Information and Communication Technology: ICICT 2022, London, Volume 1

Complete list: https://scholar.google.com/citations?user=v527Kv0AAAAJ&hl=en

Projects:

UDP Client/Server **10/2020 - 11/2020**
Simple UDP Server/Client written in Go. Server supports REST interface to retrieve log.
Link: https://github.com/kurthorvath/UDPClientServer

OpenSpeedtest -extension **04/2020 – 06/2022**
OpenSpeedtest is a pure HTML speedtest implementation which was extended by me (fork) to execute long time tests and prepare log output for further processing.
Link: https://github.com/kurthorvath/Speed-Test

XML in LabView for test automation **10/2008 - 12/2008**
XML should be used as an exchange format to exchange test cases created by developers with the test rack. The solution was implemented in LabView.

Linux command line online backup solution **01/2006 - 09/2008**
Linux Bash based backup system, backup can be incremental or full. Data is compressed as well as encrypted. As basis for this Gnu-PG (open-source) and Rsync (open-source) are used.

Trainings:
Recognizing and guiding team processes (Kapsch, 2013).
Modern C++17 (Nicolai M. Josuttis, GC, 2019)
University Didactics Basics I (University of Applied Sciences Carinthia (CUAS), 2022)
Training program for early-career researchers (Alpe Adria University Klagenfurt (AAU), 2023)

Interests:
Cloud Native Architecture
Edge computing
C++ (STL), Boost, Poco
Function as a Service
Service oriented Software
Network Engineering
Message oriented Middleware
AWS, Microsoft Azure, Google Cloud
Signal Processing and Analysis

Hobbies:
DayTrading
Travelling
Reading

Languages:
German (mother tongue)
English (business fluent)

Awards:
FH Performance Award of the State of Carinthia 2011