# VIScon 2022
## Program

# Welcome

# Welcome to VIScon 2022

We are overjoyed to welcome you back to an entire in-person VIScon this year.

The Symposium consists of 24 talks and six hands-on workshops alongside two iterations of the escape room organised by SWITCH. Not to mention, we are very excited to finally bring back the exhibition, where we display various projects you can interact with.

Our talks will give you a taste of what is happening in the world outside the lecture halls with the knowledge you gain from the lectures and the experience earned by industry professionals over the years. Don't hesitate to go up to a speaker after the presentation and ask questions. They are looking forward to talking to you and answering any inquiries you may have! Meanwhile, the workshops enable you to build up skills or learn about new topics you might not encounter until after graduating. That means you should go and experience, browse, soak in as much information as possible, and enjoy the realm of computer science in a whole new way!

We want you to walk out of the building filled with motivation and fire within to build and mould the IT world of the coming decades. Get inspired, connect, learn and most importantly:

**Have fun!**

David Kalchofner

# Food

## Breakfast                                      8:30 - 11:15

After registering, feel free to grab a drink and something to eat from the

breakfast buffet

## Lunch                                          11:30 - 14:00

We offer various sandwiches you can choose from.

Please only consume the food in the designated areas.

## Beverages                                      Start - Finish

There will be fridges with drinks in front of the lecture halls.

|  | HG D1.1 | HG D1.2 | HG E1.1 | HG E1.2 |
|---|---|---|---|---|
| 09:00 |  |  |  |  |
|  | Hello World |  |  | Audimax (HG F.30) |
|  | Opening Talk: Matthias Geel, ipt |  |  | Audimax (HG F.30) |
|  | Keynote: Raphael Marques, Migros |  |  | Audimax (HG F.30) |
| 10:00 |  |  |  |  |
| 11:00 | Accessibility on the web: History, screenreaders usage and good practices in Xaver Fleer, Nothing | Open Sesame - A Pacs Security Rundown Nicolas Forster, Luca Cappiello, Infoguard | Cloud-Readiness of ERP Systems – Typical Challenges Urban Busslinger, Vertec | Machine Learning for Anomaly Detection Adrian Schneider, Alexander Born, Airlock |
|  | The future of digital identities Cléa Benz, Patrick Amrein, Ubique | Security for Web 4.0 (aka Metaverse) Daniel Neubig, Ergon | SQL rulez! Stefan Keller, OST | Validate your digital business case faster Silvan Stich, Zühlke |
| 12:00 |  |  |  |  |
| 13:00 | Founding a Startup after ETH Thomas Schulz, Careerfairy | What's the story? And where is it heading? James Heim | Network Anomaly Detection at Swisscom Thomas Graf, Marco Tollini, Swisscom | Is Secure Messaging Secure? Kenny Paterson, ETH |
| 14:00 | To trust, or not to trust an AI system Rebecca Fencl, Belinda Müller, AWK | AI for railways inspection (AISI) Ilir Fetai, SBB | Security of Operational Technology (OT) Jan Freudenreich, Jasmin Rubin, Deloitte | Using Machine Learning to improve the diagnostics of genetic disorders David Galevski, Netcetera |
| 15:00 | Disrupting the Sports Broadcasting Industry with AI Fabrizio Pece, Vizrt | Towards autonomous Reality Capture Solutions Pascal Schoppmann, Leica | Typescripten - Generating type-safe Javascript bindings for emscripten Sebastian Theophil, think-cell | Internet Background Noise Jessica Schumacher, SWITCH |
| 16:00 | Hackers gonna hack - legally Michael A. Flückiger, Julia Badertscher, AWK | A winning combination of deep learning and Fuzzy Logic Evelyn Henschel, BSI | Zero Harm in Patient Care: Building Software for Cancer Patients Nawal Houhou, Marta Ortenbach López, Varian | Aviation meets UX Urban Kronenberger, Ergon |
|  | Closing Talk: Reto Ischi, Airlock |  |  | Audimax (HG F.30) |
|  | Goodbye World |  |  | Audimax (HG F.30) |
| 17:00 |  |  |  |  |

**VIS** con

SYMPOSIUM
HACKATHON

**10:00**

**11:00**

### Oracle APEX + Server-side JavaScript = Awesome!

Welcome to the future! Starting with Oracle Database 21c, developers can now execute JavaScript within the database.

**E 21**  Lucas Braun, oracle

### Code Your Own Event Streaming Applications Using Kafka Like a Pro

Have you ever wondered how large organizations such as Netflix or LinkedIn handle the trillions of daily events without running into scaling bottlenecks? Kafka is a distributed event streaming technology capable of solving this scaling problem.

Nicolas Mesot, Eduoard Tang, ipt

**D3.1**

### REST API – from design to implementation

Nowadays it's hard to imagine a platform without REST API. Some platforms focus just on providing REST API without UI to support business cases.

Michał Koźmiński, beekeeper

**D 3.3**

**F33.4/33.5**

**Hack the Hacker – Escape Room**

**SWITCH**

**12:00**

**13:00**

### How to Defang a Dragon (or Cyber Crisis)

Cyber crises are now a common occurrence. Tackling them requires a holistic approach...

Matthias Franke, cyber group

**E 21**

### Building a Cloud Service Provider from Scratch

Do you know how cloud providers operate? What tools and mechanisms do providers like Amazon, Azure and Google use to offer services that enable millions of developers to facilitate the creation of their applications?

Claude Hähni, Philipp Rimle, Jakob Beckmann, ipt

**D 3.1**

### Design Thinking Workshop

From the problem to the validated, digital prototype in under two hours! Learn how to create multidisciplinary product ideas and validate ideas!

Daniel Graf, Stephanie van Ophuisen, ti&m

**D 3.3**

**F33.4/33.5**

**Hack the Hacker – Escape Room**

**SWITCH**

**14:00**

**15:00**

**16:00**

**17:00**

**18:00**

| Computer Science | Entrepreneurship |
|---|---|
| Interdisciplinary | Security |

# Floorplan

## D Floor

AIRLOCK®
SECURE ACCESS HUB

ergon

HG D1.1

HG D1.2

HG D3.1

HG D3.3

HG E21

ipt

BEEKEEPER

Entrance

WelcomeDesk

E Floor

Exhibition
Floor

HG E1.1

HG E1.2
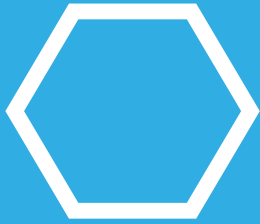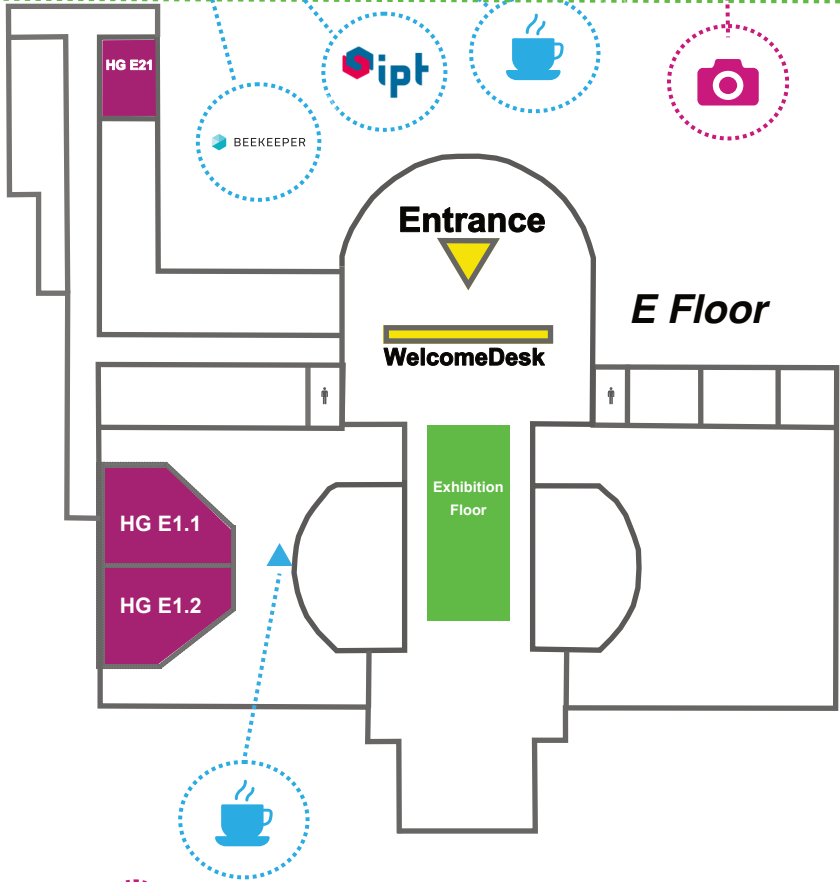
Visit our photo-booth and take a picture of you and your friends!

# Opening

## Matthias Geel

The opening is held by Matthias Geel who is the Main Architect at IPT.

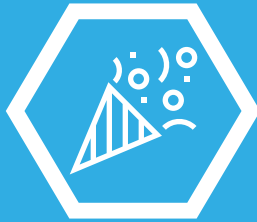To learn more about IPT check out IPT's sponsoring page at the end of this booklet.

# Keynote

## Raphael Marques

Raphael Marques is Head of Security Management at Migros Group. He has been working in information security for 15 years and has gained countless experiences in security management and security operations. After his education at the ZHAW, Raphael Marques worked for 10 years in a major bank in various security positions before he advised various companies in information security as an Information Security Consultant.

**MIGROS**

# Closing

## Reto Ischi

The closing is held by Reto Ischi who is the Team Lead for Product Development at Ergon's Airlock division.

To learn more about Airlock check out Airlock's sponsoring page at the end of this booklet.

**AIRLOCK**®

# Talks

## Tracks

- Computer Science
- Entrepreneurship
- Interdisciplinary
- Security

# Accessibility on the web: History, screenreaders usage and good practices in code

Xaver Fleer

Xaver is an enthusiastic frontend software engineer. He is passionate about building software that is both highly usable and accessible.

Why is it so important to be inclusive? There are things that you do on a daily basis that some people would not be able to do without assistive technology and properly created code. By including everyone, their human potential can be unlocked. Additionally, participants will learn about screenreaders with the help of easy-to-understand metaphors and see their use in action. Finally, we will have a closer look at why sticking to traditional HTML solutions always beats quirky custom code and how to solve complex cases with enhanced form controls.

nothing

# Open Sesame – A Pacs Security Rundown

What is the point of the best IT security concept if attackers can easily gain physical access to security zones? Access to company buildings is often controlled by PACS (physical access control systems). But are PACS really as secure as they should be? Two seasoned Red Team members of InfoGuard AG will give you insights on the typical vulnerabilities that exist in both old and modern PACS, how they can be exploited by attackers and which security concepts exist to mitigate them. The simplicity of certain attacks will be demonstrated, using common open source soft- and hardware.

## Luca Cappiello

With over 12 years of experience in IT security Luca Cappiello, possess a deep knowledge in various areas revolving around IT security. As Head of Penetration Testing & Research he leads the Penetration Testing / Red Team with passion and influences the team's current research & development topics. Prior to leading the Red Team at InfoGuard, Luca worked for different consulting companies and start-ups, where he advised several customers across a wide range of industry sectors.

## Nicolas Forster

Nicolas Forster works since November 2017 as Penetration Tester at InfoGuard AG. In his role as Senior Penetration Tester and Red Team member he is determined to help customers to improve their security with the help of various different security & red team assessments on a company wide scale.

**infoGuard**
SWISS CYBER SECURITY

# Cloud-Readiness of ERP Systems – Typical Challenges

On-premise installations of Enterprise Resource Planning Systems are still widely used. But more and more on-premise solutions are getting replaced by cloud solutions - also called SaaS, or Software-as-a-Service.

In my talk, I will explore what typical challenges ERP solutions face when they are offered as Software-as-a-Service instead of traditional on-premise installations. To name some of the typical challenges:

How are traditional interfaces to other systems impacted? Which new skills does my organization need to transform a traditional software company into a software as a service organization?

## Urban Busslinger

Urban Busslinger is an ETH Alumnus with a BSc in Civil Engineering. As Head of Software Engineering at Vertec Group he develops together with his team ERP and CRM business software in the 6th product generation.

# Machine Learning for Anomaly Detection

Creativity in coding often leads to great software, but sometimes also to malicious web security threats, unfortunately. By only reacting to the ever-new threats and exploits, security products would always be one step behind in this game of cat and mouse. As it turns out, state-of-the-art machine learning is a great technology to detect and react to unknown threats. We talk about our learnings and surprises from combining new ideas from practice and academic research.

## Adrian Schneider

Adrian is a senior software engineer at Ergon Informatik and a contributor to the Airlock Anomaly Shield. He holds a Ph.D. in computer science from the ETH and has 10 years of experience in developing web application security solutions.

## Alexander Born

Alexander is a working student at Ergon Informatik contributing to the evolutionary improvement of Airlock Anomaly Shield. He is currently enrolled at ETH BSc CSE. Before going back to the university he pursued a career in management consulting delivering data science and digitization projects.

ergon

# The future of digital identities

In today's society, digitalization is progressing quickly, with one of the objectives being to provide easier access to digital identifiers. How can we be sure of one's identity without physical proof though? Classical digital signatures are well established in several digital technologies (e.g., Covid Certificate), but run the risk of exposing valuable personal information. New proposals are on the way, which provide techniques to protect this information by leveraging modern mathematical frameworks (e.g., Zero-Knowledge Proofs).

### Cléa Benz

Cléa helps to build mobile apps (Android) at Ubique. After graduating with an M.Sc. degree in Computer Science, she worked in the private banking sector for 2 years before starting at Ubique as an Android Developer. Since then, she has contributed to several projects, as well as more recently managing projects like Covid Certificate and Swisstopo.

### Patrick Amrein

Patrick supports the development of mobile apps with a particular focus on security and privacy challenges. At the beginning of his studies at ETH Zurich, he developed the ETH MyStudies app for Windows Phone, which let him to later join Ubique. Since graduating with an M.Sc. degree in Physics, he has been working on the backends of some of Switzerland's most used apps like MeteoSwiss or CovidCertificate. He is also part of the security team at Ubique, trying to make the static and dynamic analysis of mobile apps less of a hassle.

# Security for Web4.0 (aka Metaverse)

Hyperscalers and VR/AR Unicorns already provide features, platforms and hardware. Are those good enough?

In the upcoming future, we will experience more connected networks and new virtual worlds, that replace traditional websites and apps. Will those be secure?

Security concepts (authentication, authorization, access management) need to be considered, especially for the amount of personal and private data. Will you be exposed?
How should existing concepts adapt to face the upcoming new reality?

## Daniel Neubig

Daniel Neubig is Technical Lead for Augmented Reality at Ergon and has created software solutions for over 20 years. His responsibilities include consulting customers and to design and develop modern solutions to expand the benefits of 3D interfaces and interactions.

Daniel Neubig holds a Master's degree in Computer Science in Robotics and Machine Learning from Universität Karlsruhe (TH).

ergon

# SQL rulez!

This talk gives some tips on choosing the right database system for your next project. It's about deciding as an engineer and not just following every trend. And the talk will give some examples where SQL is being used you perhaps didn't know.

Disclaimer: This talk is inspired by technical evangelist Akmal Chaudhri. And my motto is "Open Whatever".

## Stefan Keller

Stefan Keller is a full professor at OST Rapperswil (formerly HSR University of Applied Sciences). He is the director of Institute for Software, founded Geometa Lab and teaches data engineering (database systems) and data analytics, as well as geoinformation systems.

# Validate your digital business case faster

Getting in the market with your business case as fast as possible with a product as complete as necessary is key. Only if you are in the market, you can validate your idea, shape it according to customer feedback and convince investors to support your idea.

In this talk you will learn what Low-Code is, how Low-Code can help achieving a short time-to-market, what the benefits and pitfalls of Low-Code platforms are and what we learned during real-life projects.
And hopefully, with the right idea in mind, you will be able to successfully run your idea with a Low-Code application.

## Silvan Stich

After several years in engineering and project management at Zühlke, Silvan Stich has taken on the role of Head of Application Platforms as of January 2022. His focus is on team leadership and he is responsible for the development and advancement of the Application Platforms topic within the Cloud Practice. Silvan Stich gained experience with application platforms as a project manager in various projects and bid phases. The great flexibility paired with fast implementation inspires him for the technologies.

zühlke
empowering ideas

# Founding a startup after ETH

Entrepreneurship as an alternative career path offers some of the most exciting opportunities for growth on a personal and professional level. However, the journey comes with some potential pitfalls, that I would like to address, by using our own story - the tech startup CareerFairy - as an example. These include challenges such as:

- How do I start a startup after ETH without money
- How do I test, iterate and bring a product to market
- How to I get first customers
- How do I raise money from investors
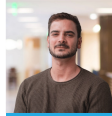


## Thomas Schulz

Thomas is the co-founder of the ETH spinoff CareerFairy, an interactive live streaming platform on which hundreds of companies across Europe showcase their work to a community of students and graduates. He obtained his Master's degree in Mathematics at ETH Zurich. After a few years spent working in Finance between London and Zurich, he fell down the rabbit hole in the world of startups and has been passionate about entrepreneurship ever since.

**careerfairy**

# What's the story? And where is it heading?

We live in highly complex and fast changing times – complexity and speed that our technologies significantly contribute to. What's the basic story of humanity's technological development – of which computer sciences are of course a key part of - and where is this story heading if we extrapolate the basic trends into the future? Our interpretation of technology's evolution influences our worldview, our self-perception and the choices we make in life, such as what we choose to study or research, our career and professional choices, or our choices as consumers and citizens.



## James Heim

Lic.oec.publ. (Master of Economics) / Worked for a consulting company and then for the business development agency Greater Zurich Area, for which I relocated to San Francisco / Since 2007 I study the impact of our current technology culture (the way we invent and apply technology) / I also work on a farm

# Network Anomaly Detection at Swisscom

IP networks are the nerve systems of today's society. We as a customer depend on it. Swisscom has a tall burden to ensure that its networks are ready to connect at any time when we need it. Network Analytics is the key to enable visibility and increase uptime and reliability by creating a digital twin for a closed loop operation.

In this talk we demonstrate and give insights how Network Anomaly Detection for L3 VPN services is performed. Which operational metrics are being used, how they are being correlated and queried in near real-time and why this is only the beginning of network verification.

## Marco Tollini

Marco Tollini received his M.Sc. degree from ETH Zurich in Information Security in 2020. He carried out his master thesis in collaboration with Swisscom, where he compared multiple machine learning algorithms for monitoring Swisscom's mobile network. He decided to move closer to the network with the Daisy team where he researches and develops new standards at IETF, tests equipment from major network vendors, collaborates with external parties to create machine learning algorithms for anomaly and novelty detection, maintains an open-source network visualization tool, and manages the Daisy pipeline. He defines himself as a Data, DevOps, and Test engineer.

## Thomas Graf

Thomas Graf is a distinguished network engineer and network analytics architect at Swisscom. Stuck with service providers since 1997. Rediscover networks in 2015 with Network Analytics. The backseat driver of the Swisscom Daisy team with network, software and data engineering enthusiasts recently expressed to feel like belonging to a startup. Authoring next generation data-collection protocols in GROW, OPSAWG and NETCONF working groups at IETF.

swisscom

# Is Secure Messaging Secure?

In this talk, I'll discuss the security of popular messaging apps - Signal, WhatsApp, Telegram, and more. What security do they promise to give their users? What do they actually deliver? What open challengees are there in this area?
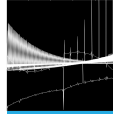
## Kenny Paterson

Kenny is a Professor of Computer Science at ETH Zurich. His research area is applied cryptography.

**ETH** zürich

# To trust, or not to trust an AI system

Would you take your hands off the wheel of an autonomous car? When striving for high performance, a crucial success factor of AI systems is often overlooked: creating a trustworthy system and calibrating a user's trust. In our talk, we present how we address sociotechnical aspects and implement AI ethics principles like fairness and transparency in practice. We show which challenges we face in this pioneering work and how you all can contribute to fostering trustworthy AI.

## Rebecca Fencl

Rebecca Fencl has an interdisciplinary background in economics and psychology. Through her Master's degree in Human Decision Science, she knows and understands the numerous influences into human decision-making behavior that have an impact in both private and public life. As part of the emerging technologies team at AWK Group, she develops services in the area of trustworthy artificial intelligence such as a framework for trustworthy use of facial recognition technology in law enforcement.

## Belinda Müller

As a consultant for Emerging Technologies at AWK Group, Belinda Müller conducts AI audits and fairness assessments. She is trained in statistics, cognitive science, and linguistics. After graduating from ETH, she worked as a data scientist and now uses this technical perspective to develop services in the interdisciplinary field of Trustworthy AI and Responsible Tech. Besides, she is a lecturer in Data Science at the FHNW.

AWK Group
Enabling digital performance.

# AI for railways inspection (AISI)

The traditional way of inspecting the tracks is done manually by the so-called "Track Inspectors". Manual inspection is not only dangerous but cannot keep pace with the ever-growing usage of the network.

The project "AI in der Streckeninspektion" (AISI) was initiated with the goal of automating the track inspection and by that closing the gap between the demands and the availability of resources. AISI uses state-of-the-art Machine Learning (ML) methods to detect infrastructure defects from images captured by our diagnosis vehicles.



## Dr. Ilir Fetai

Dr. Ilir Fetai a PhD in Distributed Information Systems from the University of Basel and is product owner of one of the first Artificial Intelligence projects deployed in production, which is used for railways inspection at SBB. In the context of his additional position as the lead of the Competence Center Machine Perception at SBB, he has various research projects running, including the SAFE AI research project.

SBB CFF FFS

# Security of Operational Technology (OT)

Operational Technology (OT) represents the backbone of many critical infrastructures and manufacturing processes. IT and OT environments are becoming highly interconnected, increasing both the likelihood and impact of successful cyber-attacks.

In our talk, we will highlight the underlying reasons and challenges, and show what steps can be taken to make critical OT environments more resilient against cyber threats.

## Jan Freudenreich

Jan uses his comprehensive understanding of attack methods and cyber threats to raise the resilience of critical infrastructure and enterprise environments. He has a technical background in IT, OT, and IoT security.

## Jasmin Rubin

Jasmin is a Senior Consultant in Deloitte's Cyber Risk Services practice in Zurich, focusing on Cyber threat intelligence and Cyber Recovery. Furthermore, she has more than four years of professional experience in the Swiss Federal Administration, working on national and international security issues,  open source intelligence, and threat monitoring.

**Deloitte.**

# Using Machine Learning to improve the diagnosis of genetic disorders

We have developed the gMendel®Test, a novel diagnostic tool that offers real-time analysis of data during the DNA sequencing process and enables accurate detection of a wide spectrum of genetic disorders.

David will discuss the challenges that arise when dealing with DNA data, writing code for real-time processing and analysis, and training robust machine learning models for the classification of genetic disorders when faced with limited data availability.

## David Galevski

David Galevski has been working as a Data Scientist at Netcetera for two years, mainly focusing on bioinformatics projects. Passionate for both academic research and software engineering, David is involved in the whole lifecycle of Data Science and Machine Learning projects at Netcetera, from research to software development and implementation.

netcetera
Software matters

# Disrupting the Sports Broadcasting Industry with AI

The quality and reliability of Artificial Intelligence (AI) applications have matured to the point that nowadays even traditionally risk-agnostic environments, such as the Broadcasting Industry, are widely adopting them. In our talk, we will explore how Vizrt is employing AI to push the boundaries of real-time graphics insertion for Sports Broadcasting. Our talk will focus primarily on aspects related to the development and deployment of AI-based broadcasting solutions, illustrating the theoretical, as well as practical challenges involved in the process of bringing research ideas to the market.

## Dr. Fabrizio Pece

Dr. Fabrizio Pece currently works as a Senior Software Engineer for Vizrt, Zurich. Prior to joining Vizrt, he was a postdoctoral researcher at ETH Zurich, working with Prof. Otmar Hilliges in the Advanced Interactive Technologies lab. His research focused on a broad set of topics in the human computer interaction (HCI) and computer vision (CV) fields, with a particular focus on different aspects of virtual and augmented reality, machine learning, mobile interaction and computational user interface design. Fabrizio earned his doctoral degree in the Virtual Environment and Computer Graphics group at University College London (2010-2014), under the supervision of Prof. Jan Kautz. Further, he earned his BSc in Computer Science from Università degli Studi di Roma Torvergata, Italy (2008) and his MSc in Vision and Virtual Environment from University College London, UK (2009).

# Towards autonomous Reality Capture Solutions

Autonomous solutions that can safely and repeatedly acquire 3D point clouds with minimal user intervention are currently enjoying growing demand, where the virtual replication of the physical world can be used to create digital twins and recreate real-world situations. But what is required to autonomously navigate through complex environments and create information-rich 3D point clouds?

We are going to dive into the different parts of an autonomous system for unmanned ground vehicles and will give insights into how we productized this technology at Leica Geosystems for the BLK ARC laser scanning module.

## Pascal Schoppmann

Pascal Schoppmann is an ETH Alumnus, holding a master's degree in Robotics, Systems and Controls, and Software Engineer at Leica Geosystems, part of Hexagon. During his master thesis he has been with the Robotic Aerial Mobility Group at NASA's JPL, where he worked on the topic of safe landing site detection for autonomous rotorcraft landing. He now focuses on the development of innovative products and concepts in the field of Reality Capture and Robotics, such as the BLK ARC. As a software engineer, he develops and implements algorithms to enhance the perception of robots.

HEXAGON | Leica

# Typescripten — Generating type-safe JavaScript bindings for emscripten

WebAssembly has become a very popular target platform for C++ developers. Thanks to emscripten, porting native applications to WebAssembly is easy — as long as the application only uses the browser as a display and input device. However, emscripten does not provide type-safe wrappers to the standard JavaScript APIs such as the DOM manipulation API, let alone any other JavaScript API provided by existing web applications. Our open source tool "typescripten" has been built to close this gap. I will discuss the challenges we faced and the choices we made when designing this framework.

### Sebastian Theophil

Sebastian has been working at think-cell Software since its founding in 2002. In the last few years, among many other things, he has ported think-cell to run on macOS. He is also the maintainer of the typescripten project which lets programmers call JavaScript libraries from C++ code compiled to WebAssembly in a convenient and type-safe way. He enjoys leaving his desk from time to time to talk at international C++ conferences.

think-cell

# Internet Background Noise

Lots of data is being sent over the internet all the time. Internet Background Noise describes traffic that is unsolicited. It is oftentimes being ignored or even filtered out. Not this time: We will deep dive into the topic, take a look at what is in the garbage of the internet and how useful it can be in regards to security.

## Jessica Schumacher

Jessica has been working as a Security Engineer at SWITCH for over 4 years. She mostly works in the field of Network Security Monitoring, Security Awareness and DNS.

**SWITCH**

# Hackers gonna hack - legally

Hacking is our passion. Cyber Security our mission. Together with our team of specialists, we challenge our clients, their anti-virus solutions, and defense teams. But while we behave (and in some cases might also look) like hackers, our intention is not to harm but to help to improve cyber security on every layer.

We are looking forward to introducing you to our approach, telling you about insights of recent jobs as well as why we consider our approach to be different from classical penetration testing and white hat hacking.

## Michael A. Flückiger

After the cold start into the security world after my studies, I soon discovered my enthusiasm for the offensive side. Together with like-minded people and hackers we form a Cyber Offense Team at AWK. Since our start a year ago, we have learned an amazing amount, and more importantly, made our customers' cyber security more secure with our attacks.

I for myself have learned that my endurance not only benefits me in sports and that creativity is also super important in hacking...

## Julia Badertscher

Cyber Security enthusiast, cat-lover, tinkerer and coffee drinker. Obsessively interested in all things computer and shiny things.

After participating very unsuccessfully in several CTF-Meetings during my studies, I dove head first into Cyber Security consulting. But I could only write so many strategies withough getting the tech-itch.  Now I am part of a newly founded diverse team of pentesters, forensic specialists, computer scientists and hackers who together simulate Cyber Attacks for customers and help them improve their Cyber Security maturity.

AWK Group
Enabling digital performance.

# A winning combination of deep learning and Fuzzy Logic

While deep learning is known as a successful technique for classification, it definitely has its limits when used on its own. This problem has not gone unnoticed in a current project at BSI, where the results of an e-mail classification system based on BERT Transformer models are not as accurate as expected. This is where the combination of deep learning and Fuzzy Logic becomes interesting.



## Evelyn Henschel

Evelyn Henschel started working at BSI during her studies in computer science and recently received her bachelor's degree. Together with BSI, she wrote her bachelor thesis about using a combination of deep learning and symbolic AI to improve classification. Currently, she is continuing her studies to pursue her master's degree.

# Zero Harm in Patient Care: Building Safe Software for Cancer Patients

Radiation therapy (RT) treatment is complex and involves multiple operators and activities from imaging to planning including radiation delivery and patient monitoring. The risk of errors increases with this complexity. Errors throughout the process can happen and could lead to patient harm.

In this talk we will look at some real cases of errors in the RT process. Then we will focus on how medical software is built to prevent harming the patient.

Finally, we will see how new technologies, from AI algorithms to mobile technologies, are improving and will further improve patient safety.

## Marta Ortenbach López

Marta is Risk Manager for Treatment Planning Solutions at Varian.

Initially she joined Varian in 2014 as System Quality Engineer, moving into her current role beginning of 2022.

## Nawal Houhou

Nawal Houhou is Sr. Product Manager for Treatment Management Solutions at the Varian Medical Systems Imaging Lab, GmbH in Baden-Dättwil with a main focus on imaging. She joined Varian in 2012 as a System Quality Engineer after completing her Ph.D. in Signal Processing from ETH Lausanne (EPFL), before moving into her current role in 2015.

varian
A Siemens Healthineers Company

# Aviation meets UX

Tired bomber pilots, a desperate air traffic controller, and things you can stick on your pencil: what do they have to do with user experience design? What is cognitive engineering, and why does it matter? Fasten your seat belts: in his talk, Urban Kronenberg will draw from airplane incidents to demonstrate how important it is to keep users with all their needs, foibles and limitations in mind when building software. Because that is what human centered design is all about.



## Urban Kronenberg

Urban Kronenberg is a user experience architect with Ergon Informatik AG. In his work, he acts as the user's advocate, putting their needs front and center so digital products will be easy to use and accessible. For Urban, this aspect is fundamental, because in today's highly competitive markets of digital products and services a good user experience makes all the difference between failure and success. Before working in the software industry, Urban worked as a designer for brands such as Canon, Volkswagen, and Swiss International Air Lines, where his passion for aviation was ignited.

ergon

# Workshops

# Code Your Own Event Streaming Applications Using Kafka Like a Pro

Have you ever wondered how large organizations such as Netflix or LinkedIn handle the trillions of daily events without running into scaling bottlenecks? Kafka is a distributed event streaming technology capable of solving this scaling problem. Moreover, this can be achieved dynamically and with minimal overhead. Kafka has established itself as a trusted tool and is used by over 80% of Fortune 100 companies.

## Nicolas Mesot

Nicolas Mesot is an ETH Alumnus with a MSc in Computer Science. During his studies, he focused on software engineering and machine learning with a pinch compiler design on the side. As an ipt consultant, he works for the UBS Card Center on API Management as well as providing an ultra-high reliability Kafka cluster to the entire organization.

## Edouard Tang

Edouard Tang is an ETH Alumnus with a MSc in Mechanical Engineering. During his studies, he focussed on computer vision and machine learning. As an ipt consultant, he worked on various projects in the insurance and banking industry. Currently he is working for UBS Card Center.

# REST API - from design to implementation

Nowadays it's hard to imagine a platform without REST API. Some platforms focus just on providing REST API without UI to support business cases. It is more and more important that the API we create allows third-party engineers easy integration with our services.

In this workshop, we're going to explore the lifecycle of a good API. We will start with an exploration of tools helping with the design of APIs such as OpenAPI. We will learn how to include best practices for APIs during the design phase, how to make it secure and how we should handle breaking changes.



## Michał Koźmiński

Michal Kozminski is a principal software engineer with a passion for developing software. He has experience building scalable systems, designing APIs and frameworks, as well as architecting secure solutions. But in his free time, he likes to dive, play guitar or just spend some quality time with family and friends.

BEEKEEPER

# Oracle APEX + Server-side JavaScript = Awesome!

Welcome to the future! Starting with Oracle Database 21c, developers can now execute JavaScript within the database. This functionality is enabled by the Multilingual Engine (MLE), powered by GraalVM. APEX 20.2 is the first (and only) low code framework on the planet which natively supports server-side JavaScript, out of the box!

In this workshop, we will be joined by Lucas Braun, ETH alumnus and Program Manager for Oracle Labs in Zurich. Lucas is also a core contributor to the MLE feature which was developed to large extent in Zurich.

If you'd like to participate in the hands-on exercises of this workshop, please reach out to lucas.braun@oracle.com before the event for being pre-registered for a free-tier Oracle cloud account.

### Lucas Braun

Lucas Braun is a program manager and principal researcher at Oracle Labs Zurich. Being a database researcher at his core, he also started looking at how databases compose with programming languages and compilers.

ORACLE

# Building a Cloud Service Provider from Scratch

Do you know how cloud providers operate? What tools and mechanisms do providers like Amazon, Azure and Google use to offer services that enable millions of developers to facilitate the creation of their applications? In this workshop, participants will learn about all the bits and pieces required to build a functional cloud service provider. They will get hands-on experience with tools like Docker, Kubernetes and service brokers. The use case we will present is directly based on a real use-case we are working on at one of our customers.

## Claude Hähni

Claude is an ETH alumnus that has gained his first experience with virtualization and Kubernetes in Academia, working on a micro-service oriented Internet architecture deployed at large scale. Currently, he's working as an ipt Consultant for the Federal Office of Information Technology, Systems and Telecommunication (FOITT), where he puts his passion for Cloud Technologies to use.

## Philipp Rimle

After focusing on machine learning at the end of his studies, Philipp wanted to learn more about the Swiss industry and what challenges they were facing. He joined ipt as a Consultant and currently works in two teams, both part of the Federal Office of Information Technology, Systems and Telecommunication (FOITT).

## Jakob Beckmann

Jakob Beckmann is an ETH Alumnus with an MSc in Computer Science. During his studies, he focused on software engineering and programming languages, including working as a TA for courses such as COOP and ASL. As an ipt consultant, he mostly works for the Swiss government on cloud orchestration and automation, implementing the Swiss PaaS/SaaS offering for various federal offices.

# Design Thinking Workshop

From the problem to the validated, digital prototype in under two hours! Learn how to create multidisciplinary product ideas and validate ideas! Be inspired and get to know the interplay of different tools such as Design Thinking, UX and agile approach. In this way, you quickly become innovative, create better solutions and gain a strategic advantage.

## Stephanie van Ophuisen

Steffi is a Senior Interaction Designer from Zurich, believing that human centered design is the key to an excellent User Experience and product.

After getting her Diploma in Communication Design at FADK in Frankfurt am Main, she moved to Zurich to start her career in different advertising agencies. She increased her knowledge for on- and offline campaigns with several advanced trainings in Switzerland and Europe. After 8 years of intense advertising work, she started a new challenge in the IT industry to dive deeper into digital transformation, User Centered Design and technology based topics. Her latest degree is the Certificate of Advanced Studies in Human Computer Interaction Design «Requirements Engineering» (University of Rapperswil).

## Daniel Graf

Daniel has been in the IT business for 30 years and has extensive experience in programming, business processes and user-centric design. He loves putting the user first and designing applications for the user. He often sees himself as a mediator between the various disciplines in a design thinking project.

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# How to Defang a Dragon (or Cyber Crisis)

Large cyber crises that cause society to grind to a halt have become a common occurrence. Tackling them requires a holistic approach: technical solutions to restoring the IT systems, political negotiations on how to help people affected by it, engineering decisions to contain the problem. No matter your background, in a cyber crisis your expertise will be useful. We would like to offer you the chance to experience this yourself by tackling some fictional cyber crises.

## Cyber Group

ETH Student Organisation that organises talks and workshops all about cyber security. As a student initiative at ETH Zurich, we want to bring the topic of cyber security to students and create a network between students, academia, industry and the public sector via talks, workshops and training for the Cyber 9/12 Strategy Challenge.

## SWITCH

SWITCH is the competent and trusted partner for digitalisation issues that jointly concern the education, research and innovation community in Switzerland. The independent foundation helps universities and other partners within and outside the academic world to make effective and efficient use of the opportunities presented by digitalisation. SWITCH has been the registry for .ch and .li domain names since the early days of the internet. SIB partners with SWITCH's competence centre for security on the internet. SWITCH operates a multi-sector Computer Emergency Response Team providing services for universities as well as for the private sector.

## Hack the Hacker - the escape room

A click on a link in an email infects the computer system of your organization with ransomware. It's up to you and your team to rescue the data. The mission of your team is to find the code that revokes the encryption executed by the malicious software. Together with up to 5 people you have to search the hacker's den for hidden hints and clues.

SWITCH

# Exhibition

# Digital Einstein

To celebrate the centenary of Einstein's Nobel Prize in Physics, ETH Zurich has harnessed expertise to bring its most famous alumnus to life as an animated character. The platform offers an opportunity to strike up a conversation with a digital Einstein.



## Digital Einstein

Einstein's digital twin is every bit as communicative as he was. The 3D-animated character answers a wide variety of questions and will even throw the occasional counterquestion or witty remark at the person he is chatting with. A conscious decision was made for the digital figure's 3D appearance to portray a young Einstein, in keeping with his time in Zurich. The "Digital Einstein" with his ability to see, hear and interact with the person in front of him is driven by a complex algorithmic system developed by Animatico. Key technologies deployed here include dynamic rendering of the individual's expressions and body language, natural language processing and intention recognition.

# Raptor

RAPTOR is about rapid aerial pick-up and transport of objects by robots! At our stand, you can see our drone which we use for aerial grasping and interact with a number of different soft robotic grippers the drone can use to pick up many different objects!

## RAPTOR Team

Having started out as a focus project at the Soft Robotics Laboratory at ETH Zurich, we are a team of 8 students with a mechanical and electrical engineering background on a mission to bring aerial grasping and manipulation into real-world applications.

# Geranos

The Geranos UAV is a UAV designed for the precise aerial transportation of poles. We will discuss its design and test the novel gripping mechanism in a showcase prototype.

## Geranos

I am a representative for the project Geranos.
A VTOL UAV for the precise transportation of vertical poles.
Right now I am studying Robotics, Systems and Control at ETH Zürich.

# Scewo AG

Futuristic, aesthetic, functional. This is Scewo BRO, the world's only electric wheelchair that combines driving on two wheels and climbing stairs. It can be operated without torso stability and is able to master uneven surfaces just as easily as stairs and inclines. The chairlift not only ensures easy transferring but also makes it possible to talk to other people at eye level. Developed by and for people with limited mobility, their concerns and wishes are at the centre. Our pursuit of the highest quality and user-friendliness as well as the combination of modern design and technological innovation makes them a reality. The pioneering design of the Scewo BRO has already received several awards, including the Swiss MedTech Award 2021, the German Design Award 2021 and the RedDot Award 2019 Best of the Best.

## Scewo AG

Creating a world where persons with reduced mobility can discover independently and flexibly.

A bold but incredibly rewarding mission to which every single member of the Scewo family is committed.

We stand by the vision that every person with reduced mobility can reach any place independently and flexibly. In order to achieve this, we are rethinking, recombing technologies and boldly embarking on new paths. Through the interplay of person, design and technology we develop lifestyle solutions that move users forward.

Ahead of us lies an incredibly exciting journey with countless challenges, various new destinations and previously unexplored technologies. With our values guiding us, we are prepared for all challenges on our journey.

# Surfsimulator ti&m

**ti&m** ti&m AG
big ideas. creative technology.

ti&m stands for technology, innovation & management.

Stay agile on our Surfsimulator!
At ti&m we like to stay agile on and off the surfboard. Collect the most gold coins while avoiding rocks, sharks and bottles with our pixel design surfer and beat our top score. We're excited to see what you can do!
By the way: When our surf game isn't on display at events, you can find it in our offices. Surf the wave of success with us!

We are leader for digitalization, security and innovation projects and products in Switzerland and we are striving to do the same in other financial and technology centres. We offer our discerning clients vertical integration throughout the IT value chain. At our offices in Zurich, Bern, Basel, Frankfurt, Dusseldorf and Singapore, we currently employ over 530 outstanding engineers, designers, and consultants.

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# Artifact

Come to our exhibition to see how a fresh professional service provider grows by delivering impact with data science for business clients.

There is a challenge for YOU to test how much you can think out of the box!!!

## Artifact

Artifact is dedicated to empowering people with AI for the better. As a professional service provider, Artifact does Data Science – keeping an innovation mindset, a people focus and an agile drive. Artifact's team masters the ART of Data Science to generate FACTs based on data. Depending on the client use case, this can span from Deep Learning over NLP or Computer Vision to Optimization. The team's aim is to find pragmatic and sophisticated solutions with the best suited technology that lead to real impact for the business clients.

# Hackathon

## Opening Ceremony
## Friday, 15.10. 15:00 - 17:00

- Welcome by VIS and D-INFK

- Opening speech by Gabriela Keller - Ergon

- Presentation of the schedule and Hackathon projects
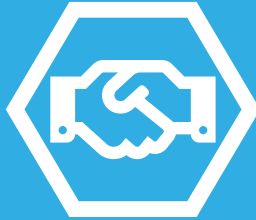
- Apéro

## Hackathon Start
## Friday, 15.10. 18:00

- Introduction of mentors

- Assigning teams with projects

## Hackathon End & Closing Ceremony
## Sunday, 17.10. 13:30

- Presentation of the completed projects

- Closing speech by Andrei Isac - Beekeeper

- Award ceremony

# Sponsors

A big THANK YOU to our sponsors!
VIScon would not be a reality without you!

## Main Sponsor
## Airlock

Airlock® delivers security innovation technology built with state-of-the-art software engineering by Ergon Informatik. Established in 2002, we are deeply committed to advancing security innovation. The Airlock® Secure Access Hub protects more than 30,000 applications against unauthorised access, globally, with over 20 million active identities.  The Hub is the only one of its kind in the world that provides an integrated solution composed of: API Edge Gateway, Customer Identity and Access Management, and Web Application Firewall. Airlock® is a sub-division of the preferred-employer Ergon, with a current fleet of 65 members of staff, and growing rapidly. We are famous for our collaborative, transparent and innovation-driven work culture, which ensures that we continuously strive to improve across the entire organisation.

## Main Sponsor
## beekeeper

**BEEKEEPER**

Beekeeper is a mobile platform that serves as the single point of contact for frontline workforces. With all communications and tools in one place, Beekeeper empowers frontline employees to be more productive, more agile, and create a safer workplace.

Deskless workers can check resources and share best practices in real time. Managers can resolve issues quickly, handle non-routine work efficiently, and track team performance. Executives can increase business resilience and agility in uncertain times. Our secure platform offers a consumer-grade employee experience at scale and integrates seamlessly with organizations' existing tech stacks.

We have offices in Zurich, the Bay Area, Berlin, and Krakow. Our product is used in over 137 countries around the world.

## Main Sponsor
## Ergon

Ergon is a Swiss leader in leveraging digitalisation to create unique and effective client benefits, from conception to market, the result of which is the international distribution of globally revered products. Ergon has realized the first e-banking in Switzerland, was the first "Authorized Java Center" in Europe, has built mobile applications before there were smartphones, and was one of the first Swiss companies to successfully implement projects on the Internet of Things.

We combine our extensive technological, security and business experience to design "smart" solutions from complex requirements. Anticipating tech trends, Ergon's highly-qualified experts develop and deploy user-friendly, custom software, as well as proven, off-the-shelf products, for many industries, worldwide.

The company, which now employs more than 350 members of staff, was founded in 1984. We have won a number of awards for our corporate culture. In 2021, we were recognised for the third time (after 2018 and 2012) as the best employer in Switzerland. Learn more about your career at Ergon here: www.ergon.ch/careers.

# Main Sponsor
## ipt - Innovation Process Technology

ipt is a Swiss IT consulting company. Despite being on the market for more than 25 years, we have retained our start-up mentality: 170 People, No Politics, Flat Hierarchy, Lots of Fun!

We develop innovative software solutions on-site and together with our customers using leading-edge technologies. Our focus is AI + data, digital experience, cloud and agile organizations. Our people define who we are! Employees are our backbone, and everyone can contribute.

Like every year, our people, who were also university grads, will be on-site to have two workshops with you about leading-edge technologies and topics from the industry. Nicolas Mesot, Edouard Tang, Philipp Rimle, Jakob Beckmann and Claude Hähni are looking forward to meeting you and to share their expertise with you. See you there!

## Co - Sponsor
## BSI

Our story started in 1996. We specialize in state-of-the-art omnichannel software for customer data management and marketing automation. We are at home in Baar, Baden, Bern, Düsseldorf, Darmstadt, Hamburg, Munich, and Zurich. There are 400 of us, with more than 250 employees being part owners. No hierarchies, no org chart. We are a network and use a role concept. The same opportunities and beginning salaries for everyone. Strong values. That is who we are.

## Co - Sponsor
## Varian

Can you imagine a world without fear of cancer? We can!

It is our commitment to innovate med-tech for cancer care. Varian, a Siemens Healthineers Company, in Baden-Dättwil is a research and development center, pioneering advances in radiotherapy solutions in the fight against cancer. We are a key regional player in the high-tech sector, and the global leader in the radiotherapy business.

Our site employs more than 380 software developers, hardware engineers, computer scientists, physicists and other technical professionals united by purpose to power new victories in cancer care.

Committed, dynamic and with a passion for an
autonomous future, we revolutionize the digital world –
in real-time.

Our innovative solutions and products are characterised by the highest
efficiency and reliability. They are used wherever it is all about recording,
analysing and presenting 3D information. Help us to improve the future,
become part of our team and a global success story.

Leica Geosystems is part of Hexagon, a leading global provider of
information technology solutions that drive productivity and quality across
geospatial and industrial landscapes.

## Co - Sponsor
## Zühlke

Zühlke is a global innovation service provider. We envisage ideas and create new business models for our clients by developing services and products based on new technologies – from the initial vision through development to deployment, production, and operation. We specialise in strategy and business innovation, digital solutions, and application services – in addition to device and systems engineering. Our outstanding solutions provide unique business value and a reliable foundation for sustained success.

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# Team

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For the more than 2,400 Bachelor and Master students of Computer Science, Data Science and Computational Biology and Bioinformatics at ETH Zurich, VIS is the first point of contact for events, excursions, support during their studies and university political representation towards the Department of Computer Science of the ETH.

All these services, from welcome weekends for first-semester students, through exam preparation courses for the most important exams, to the largest academic job fair for computer science in Switzerland, are organized entirely on a voluntary basis by around 250 students alongside their studies.

VIS is part of the VSETH, the umbrella organization of all student organizations at ETH, which represents the more than 20,000 students towards the university in terms of university politics and, like VIS, is omnipresent in student life outside the lecture halls.

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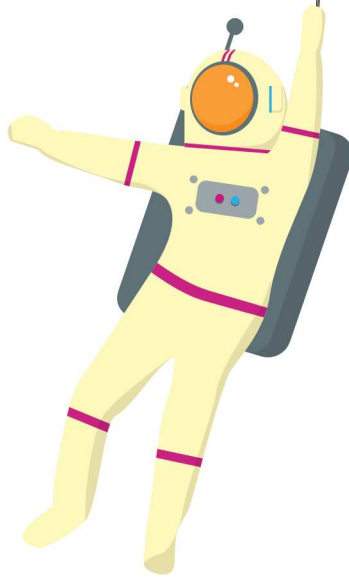Auflage: 900



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