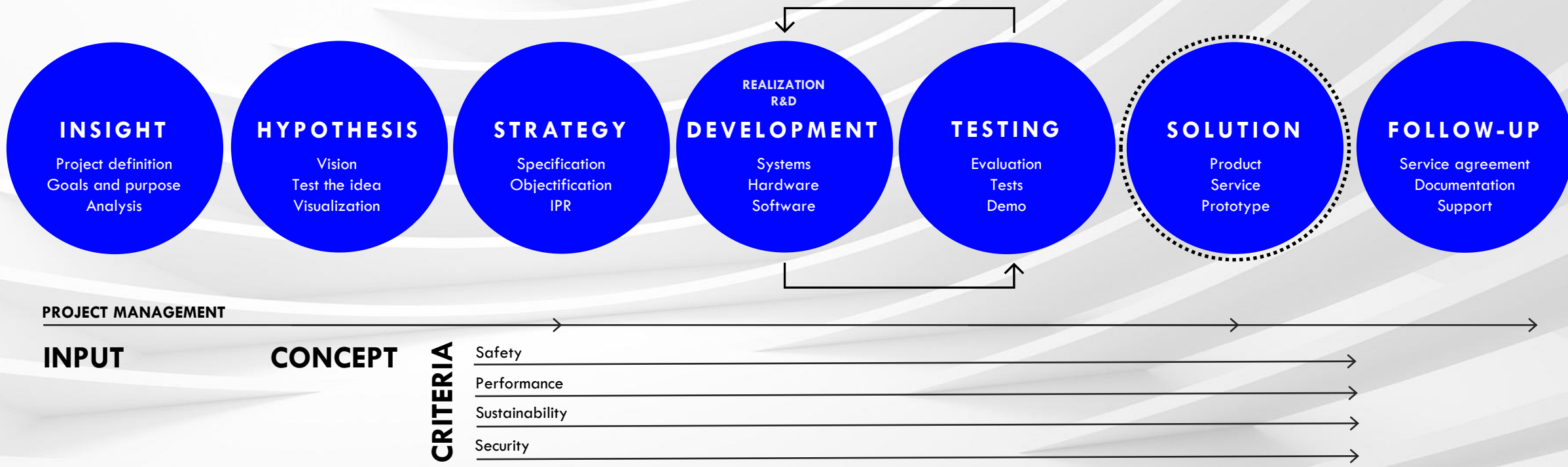


AGENDA.

- About Qamcom Group
- About Qamcom Research & Technology (QRT)
- About Qamcom Central Europe (QRTCE)
- References (QRTCE)
- Contacts (QRTCE)

OUR PROCESS.

Value driven technology development process fuelled by expertise, experience and research:



EVOLVING PEOPLE WITH AGILITY AND OWNERSHIP.

- Self-managing teams
- No CEO or management
- Role-based setup
- Decentralized decision-making
- Creative and agile environment
- Responsive and developing approach



OUR COMPETENCES.

SOFTWARE DEVELOPMENT

Embedded system development • FPGA programming •
Data Science • Back-end development •
Front-end development • Web development

Some tools we use: C • C# • C++ • Java • VHDL • Verilog
• Python • Javascript • Typescript • Angular •
Graph databases • Neo4j

ARTIFICIAL INTELLIGENCE

Machine Learning • Neural Networks • Expert Systems •
Computer Vision • Robotics •
Natural Language Processing (NLP)

Some applications: Object Recognition & Manipulation
• Predictive Maintenance • Emission Reduction •
Traffic Prediction • Patient Monitoring • ADAS •
RPA • Stock Monitoring • Pest Management •
Workforce Planning



OPERATIONAL RESEARCH

Systems Engineering • Routing • Scheduling •
Project Planning • Transportation •
Multi-Criteria Decision Making

Related problems: Automation • Critical Path Analysis •
Network Optimization • Forecasting •
Supply Chain Management •
Inventory Management • Allocation Problem

OTHER SPECIALTIES

IT Architecture Design • Drone Technologies •
Cloud Technologies • Test Strategy, Testing •
Agile Project Management • IT Security

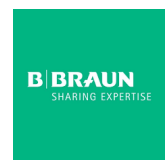
And more: Mass Spectrometry • Functional Safety •
Teal management consulting

WHO WE WORK WITH.



Fyrqom

Meela



Customer story – RGNT

Connected bike user interface for RGNT No.1

- Solved design challenges with hard production deadlines
- Features of the public road-approved vehicle HMI:
 - Drive-train mode selection
 - Monitors charge statistics
 - Positioning, map services and cloud connectivity
 - Fleet management and big-data ready backend



“Qamcom understood and put energy into our vision and high expectations regarding the technology both in software and hardware.”

Alexander Lewandowski
**Head of Design & Engineering at
RGNT Motorcycles**

Customer story – SKA

Reveal the secrets of the universe with the world's largest telescope

- Radio telescope with over one square kilometer of collecting area
- Responsible for final design and industrialization of the digitizer that converts the collected analogue signals to digital signals
- Providing advanced low-noise signal (electrical and mechanical) expertise
- Realizing the research in order to enable investigation of the deepest corners of the universe



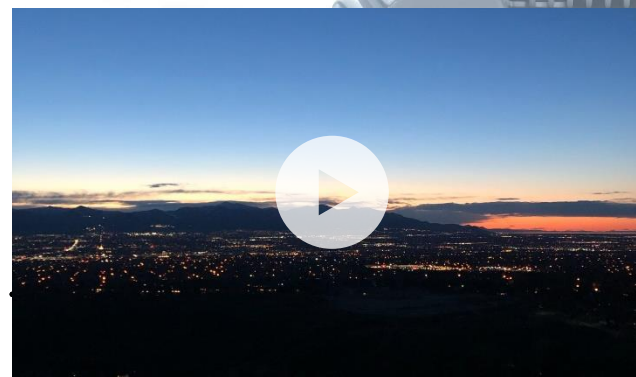
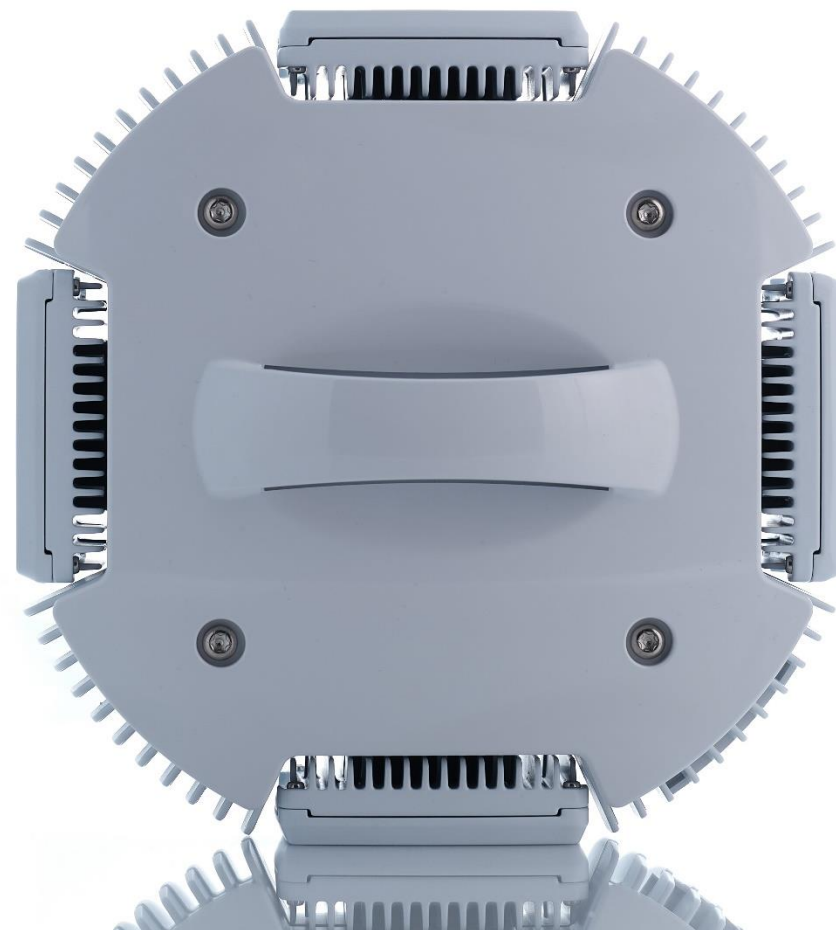
“Qamcom’s impressive expertise within the field of low frequency signals, in relation to both electronics and mechanics, is considerably valuable for Chalmers, SKA Project and the astronomers.”

Paul Häyhänen
Head of Innovation and Project Management at the Chalmers Industriteknik Foundation

Customer story – Vivint

Improving smart homes with gigabit speed

- Utilizes the license free 60 GHz (V-band) spectrum
- Self-organizing, self-healing and utilizing a zero-touch configuration framework
- 360-degree coverage and an IPv6 MESH network as backhaul



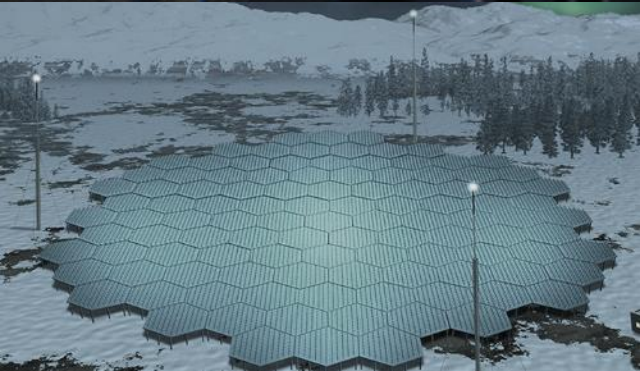
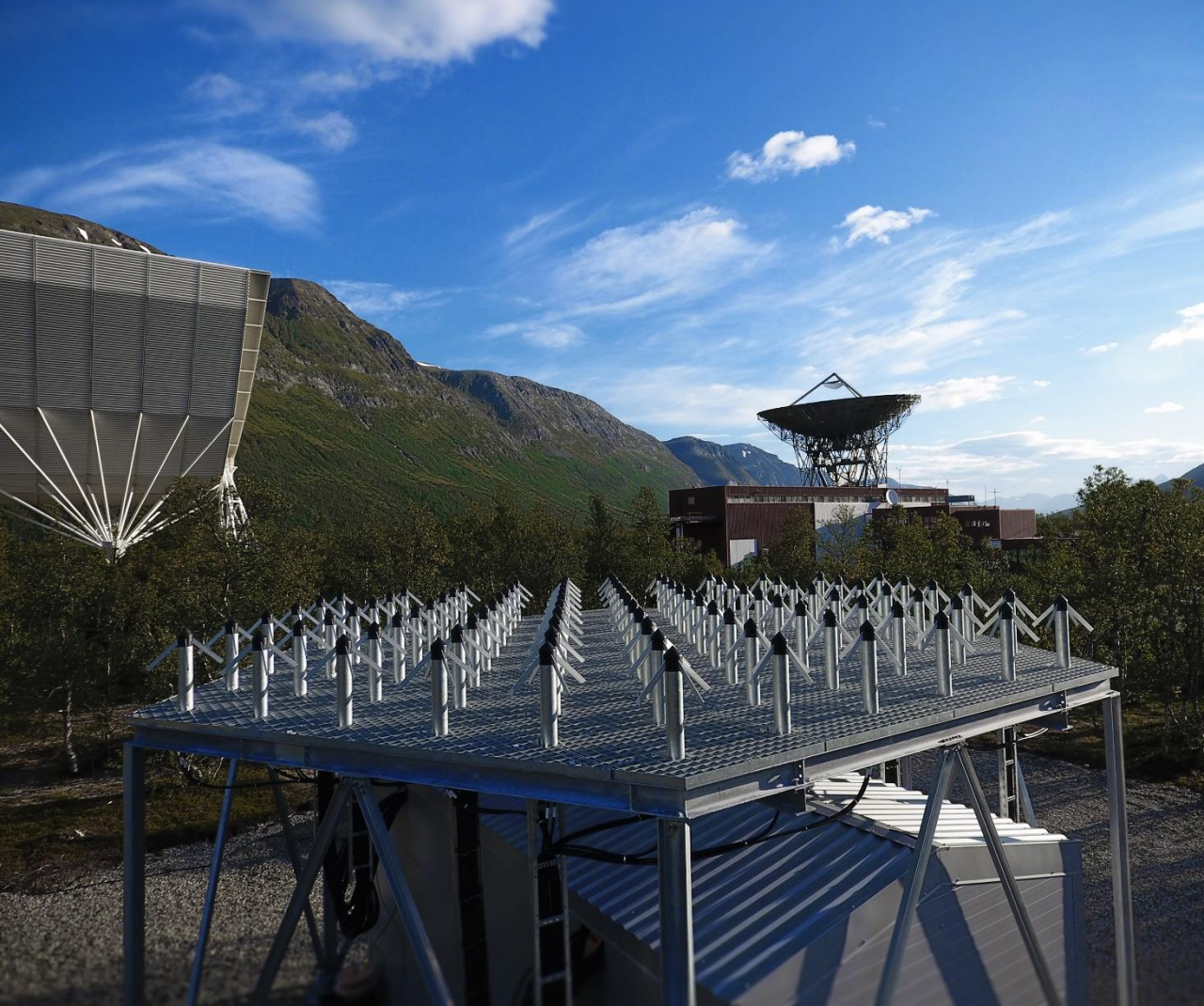
“We selected Qamcom because of their mix of highly talented teams and experience with rapidly prototyping complex outdoor networking products – along with their proven ability to get products into mass production.”

Mike Hart
CEO & Founder at Aervivo

Customer story – EISCAT

Climate research through a huge radar system

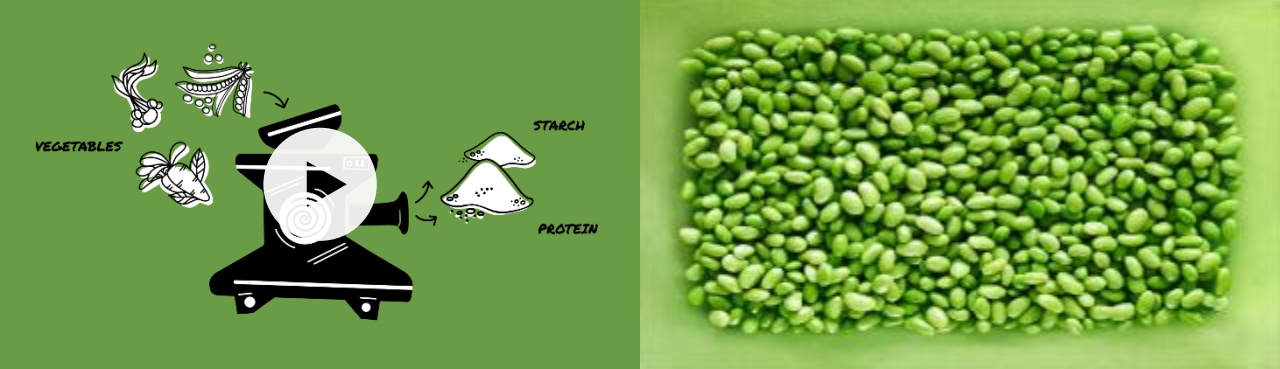
- EISCAT Foundation’s objective is to study particles, Aurora Borealis and space debris in the upper atmosphere
- Development and production of steer and control card for the transmitting antennas
- Providing advanced radar technology expertise
- Qamcom’s solution simplifies, speeds up and enhances the accuracy of the studies



Customer story – LibriXer

Vegan protein through mechanical engineering

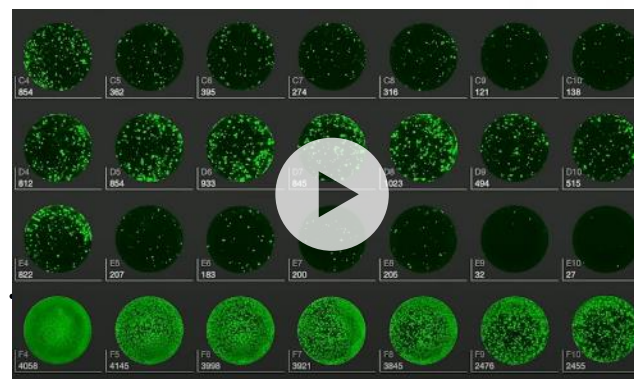
- Redefining sustainability from different aspects in terms of reuse, recycling refinement and reduction
- Assisting in mechanical design to improve the process
- Further contributions and help in the form of IP-work, positioning, design and packaging
- Instant material separation through a dry, advanced and energy efficient technology process – with zero emission and no chemicals



Customer story – Mabtech

Spot analysis into vaccine development

- Reinventing spot analysis – accurate counting and volume estimation
- Plug-and-play – consistently high performance and ease of use
- Innovative hardware enabling self-calibration and software providing automatically optimized settings



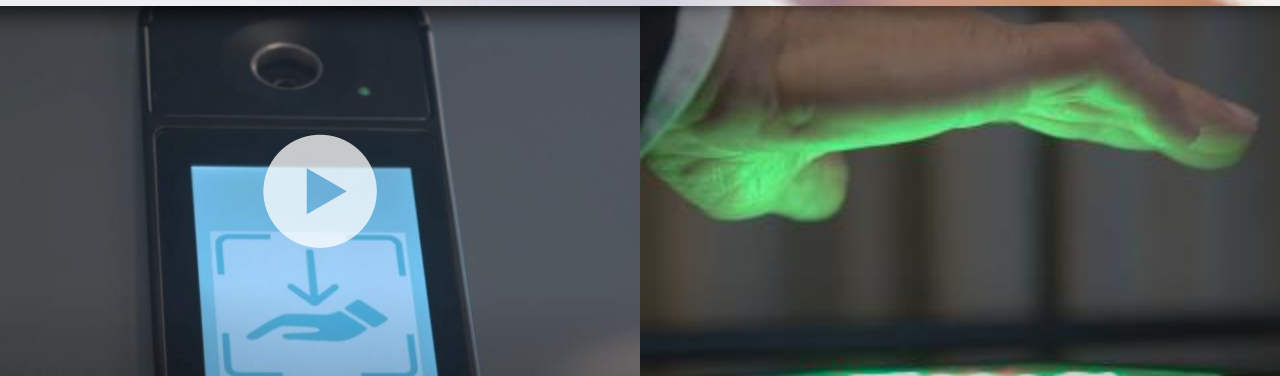
“As a partner Qamcom overcome significant development challenges and delivered some brilliant enhancements to the product that even we had not thought of.”

Christian Smedman
Chief Marketing Officer at Mabtech

Customer story – RTHS

Hack a pandemic with a holistic health scanner

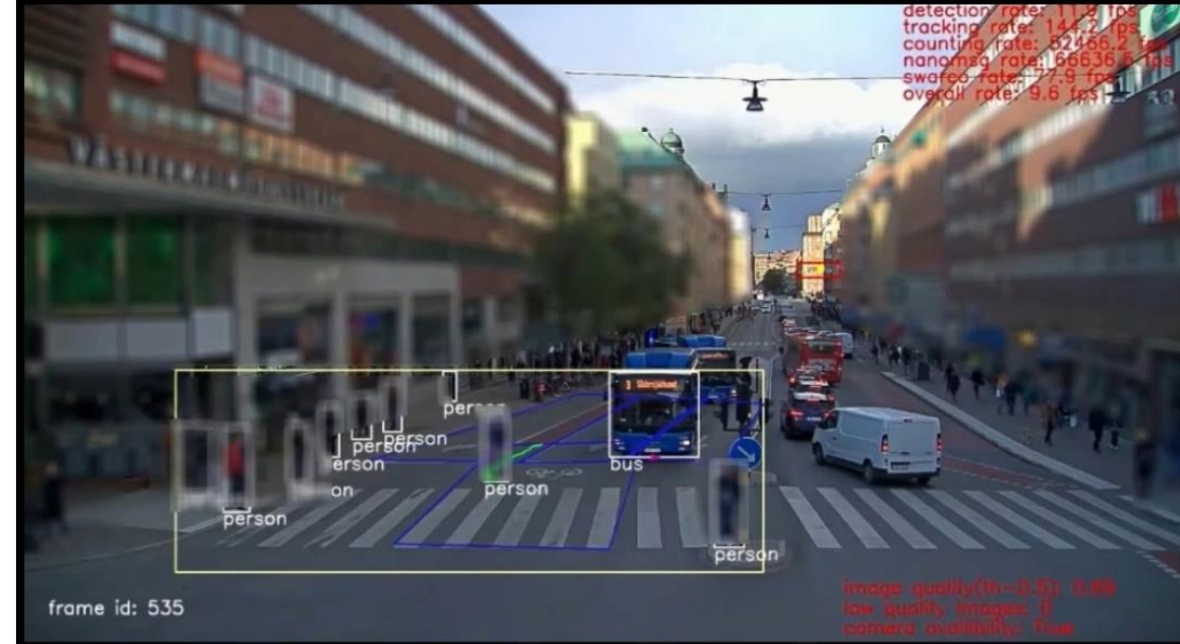
- Real time, automated hand scanner that can detect possible symptoms for different infections in a matter of seconds
- Part of the research and development process from the start – leading the system as well as the software and hardware development



Customer story – Stockholms Stad

Help Stockholm become the world's smartest city by 2040

- A multi-function sensor system for Smart City solutions
- Advanced neural networks for object detection, classification and tracking
- Simultaneous detection and counting of vehicles and pedestrians for real-time traffic light management and data collection



Device 1 - Stream data

Date 2020-04-16

Time 15:25:34

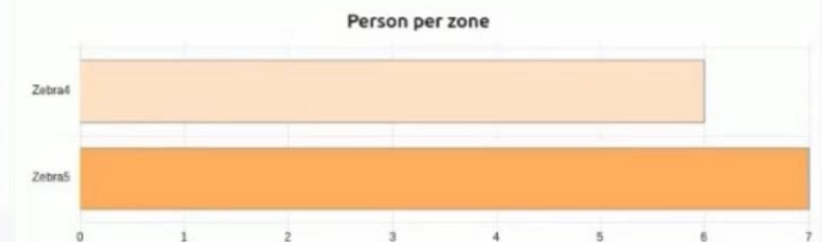
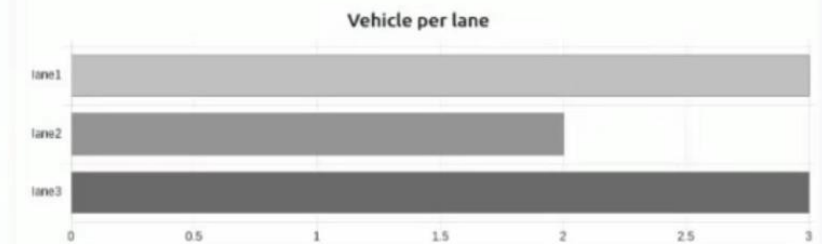


Type person

Direction Straight

Weather Condition Sunny

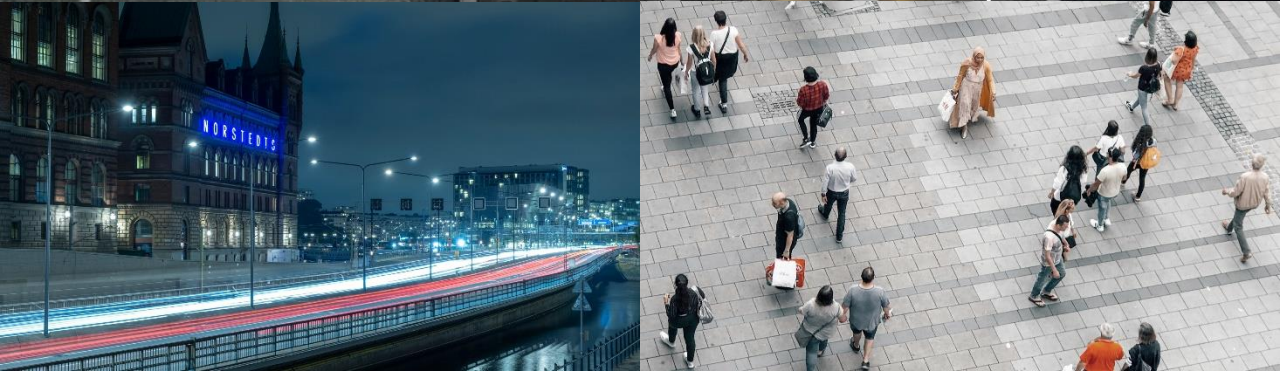
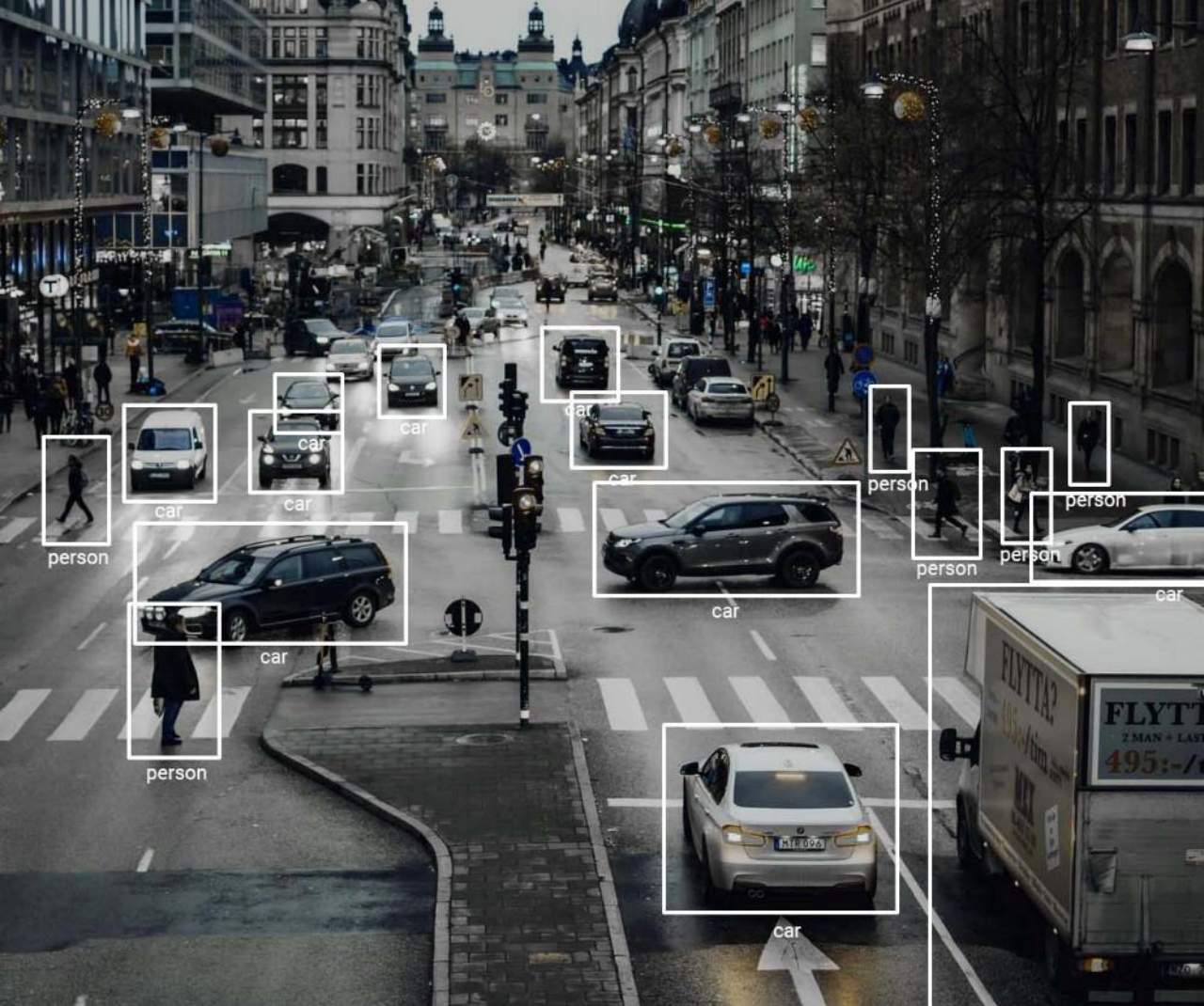
Device 1 - Cumulative Pass



Customer story – Stockholms Stad

Help Stockholm become the world's smartest city by 2040

- A multi-function sensor system for Smart City solutions
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Customer story – Aviat

Algorithms into Next Gen HTF

- Industry leading latency via a simple firmware upgrade to installed systems
- Reapplication of communication theory through state-of-the-art algorithms
- A 75% reduction in latency; a major improvement in the race to zero latency
- Achieved on budget and within an aggressive time frame



“Since 2012 we’ve been involved at the cutting-edge of low latency networks. The software and firmware upgrade from Qamcom dramatically reduced the latency of our solution. It enabled us to maintain that edge.”

Matthew Hansen
VP Product Line Management at Aviat Networks

Customer story – Telecom

Adding expertise in a world leading organization

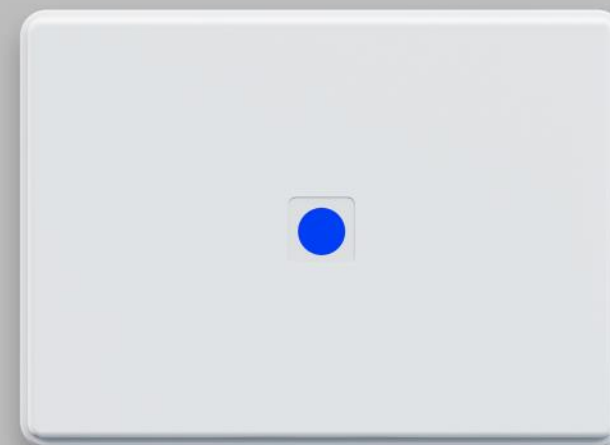
- Qamcom turns wireless connectivity into greater availability through ample experience and extensive expertise
- More than 20 years of experience in the field, working with many of the global Telecom vendors
- Active in the 6G research project Hexa-X
- Qamcom is the perfect Telecom partner through the whole process – from prototype to products ready to deploy



Customer story – Hugin

Smarter societies with 4D imaging radar

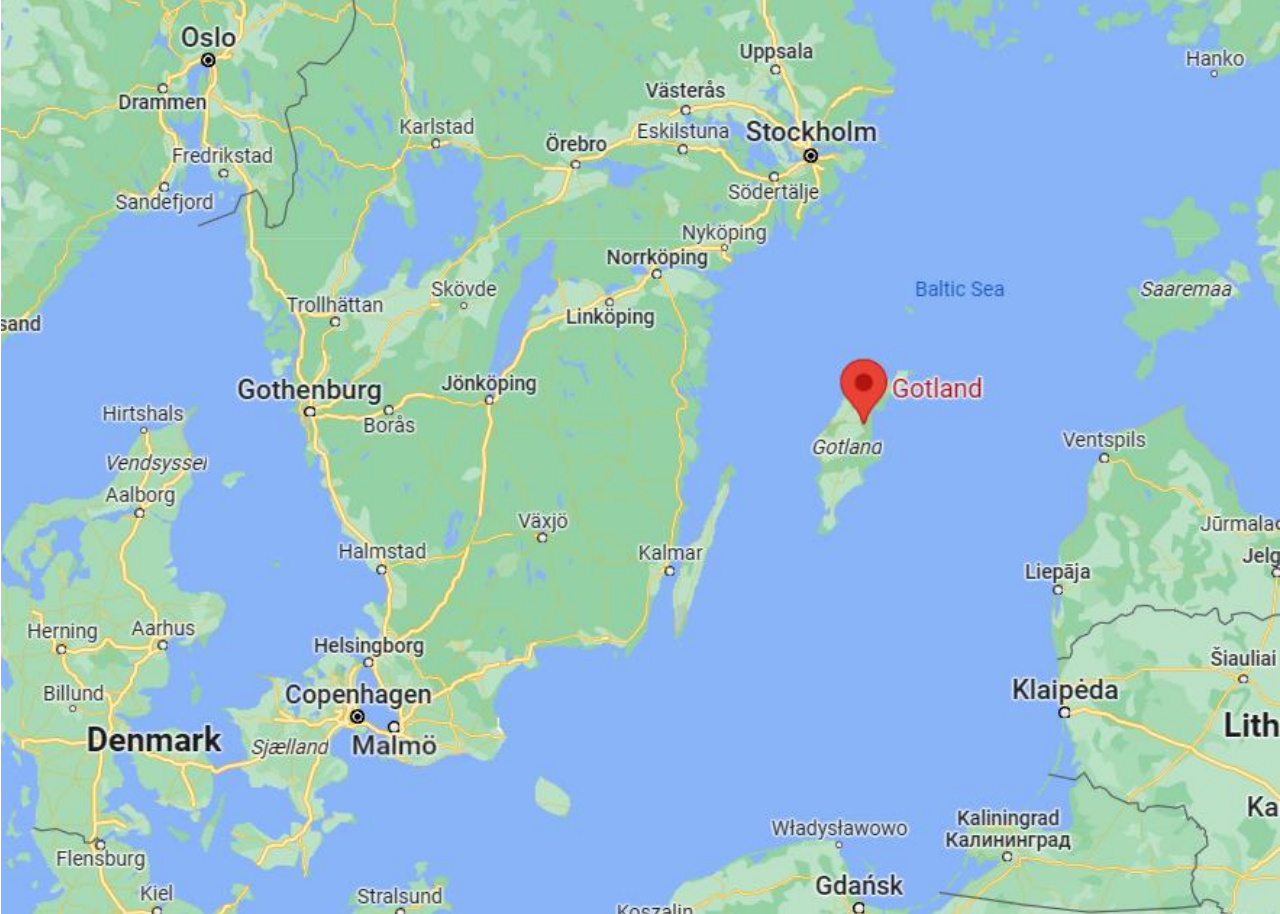
- A technology for industrial autonomy
 - with the capability of detecting and separating hundreds of static and moving objects simultaneously.
- A wide field-of-view, long detection range and high resolution
 - provides an ideal solution for monitoring and surveillance, ensuring safety and yet integrity



Customer story – Gotland

Smart Electric Grids together with Smartergy

- AI based forecasting methodology for power consumption of transformers in Gotland and EV charging stations
- Optimal sizing and composition of electric storages (including Li-Ion Batteries, Flywheels, Supercapacitors)
- Intelligent control of electric storage charging/discharging, optimizing for shaving electricity power peaks



Customer story – OnRobot

Safe Human-Robot Arm collaboration

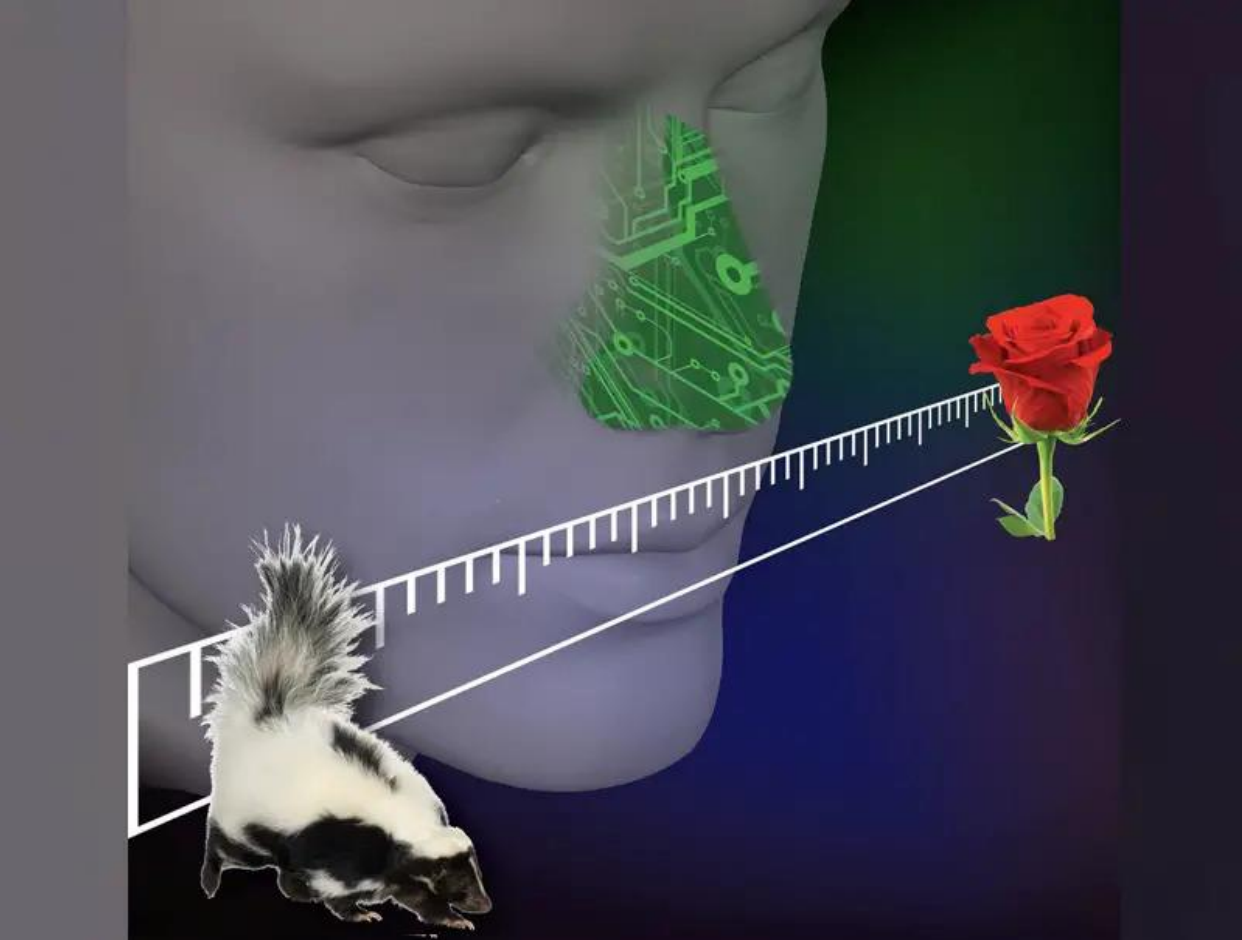
- Evaluation of sensor technology, placement and sensor fusion for human and robot arm detection
- Selection of sensor data acquisition and pre-processing algorithms
- Evaluation of methods for detecting and tracking humans and robot arms
- Selection of real time human-robot arm distance calculation algorithms
- Design of conceptual solution



Customer story – Electrolux

Gas Detection and Classification

- Evaluation of gas sensor technology
- Evaluation of the Bosch BME688 Gas Sensor and Development Kit for gas detection
- Development of several machine learning and AI based models for gas classification from gas sensor data
- Model performance evaluation on various chemical compounds and mixtures



Customer story – Antenna Entertainment

Broadcasting solutions

Delivering business critical applications:

- VOD Metadata Package Generator: a flexible and stable solution that produces 2000h+ video content with correspondent metadata package for 25+ Video On Demand providers (like Vodafone, Invitel, UPC, Telekom).
- Channel Manager: interfacing the schedule editor system to the playout: schedule transformation and asset delivery, feedback reporting fed by playout API. Preparing playout-specific playlist files.
- Secondary Events Engine: provides on-screen navigation control for ~16 TV channels.



Customer story – Fyrqom

Tire pressure sensor registration

Participate in development of a custom tool as a backup solution to communicate with the EU regulated Tire Pressure and Temperature Monitoring Systems (TPMS) by interfacing factory IT system with 3rd party handheld scanner.

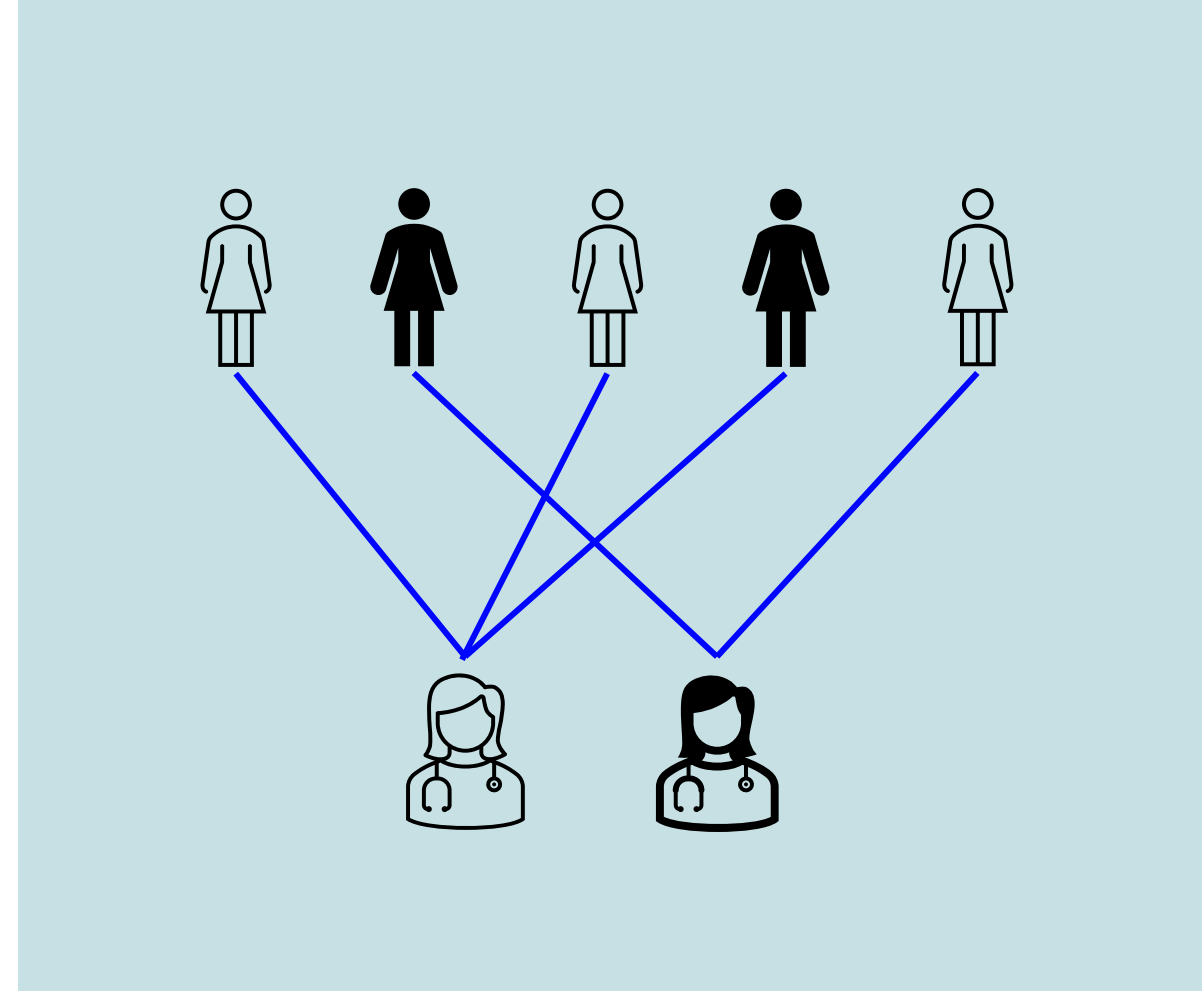
- Prototype building
- PLC interfacing
- Cloud-based device control



Customer story – Meela

Optimised patient-therapist matching system

- Recommendation system for patients based on their preferences and the therapists' capacities
- Optimised distribution of patients between therapists
- Fully anonymised solution for the patients
- Design and implementation of the matching algorithm in the core of the [system](#)



What strikes me most is that with every client I've matched with, the alliance has kicked in from the start. The matching tool obviously works!

Jenny Nordqvist, psychotherapist
(meelahealth.com)

Customer story – IT security

Secure upgrade solution for a medical device

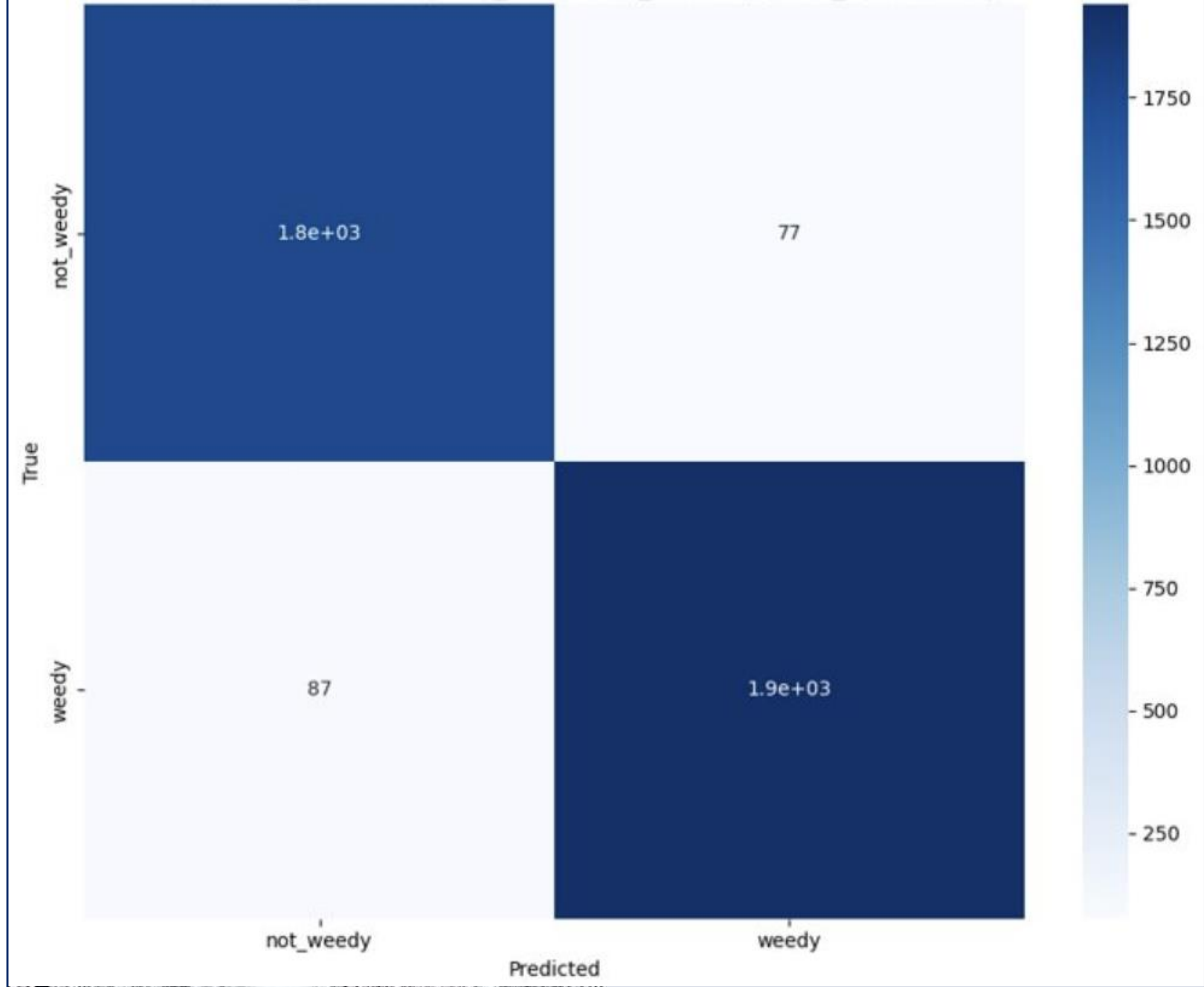
- MDR (EU 2017/745) compliant offline secure upgrade solution for a medical device using digital signatures
- Using customer's PKI
- Software signing integrated to customer's CI/CD pipeline
- Extension of the existing install/upgrade procedure to keep impact on codebase low



Customer story – G&G

Automated weed detection for herbicide consumption optimization

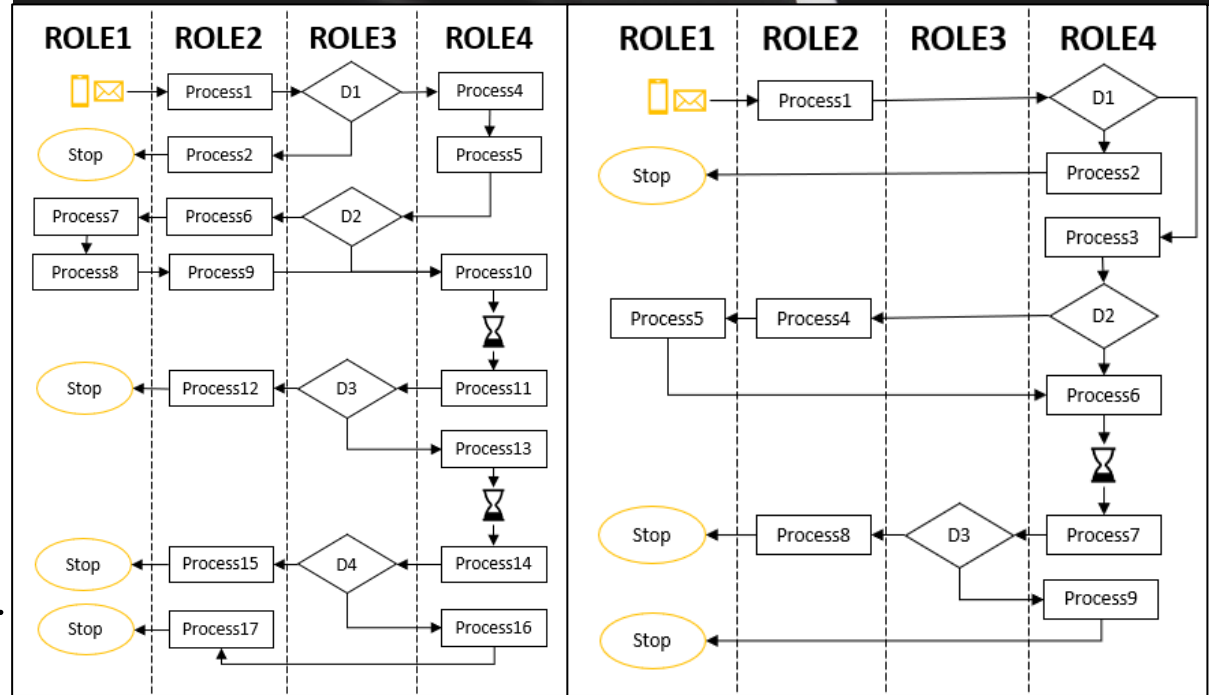
- Proof of Technology for potential automated weed detector being able to distinguish between several different group of plants
- Support in the system design with camera selection and data collection protocol
- Implementation and analysis of a neural network based prototype of a final solution



Customer story – Carglass

Customer Service Process Optimization

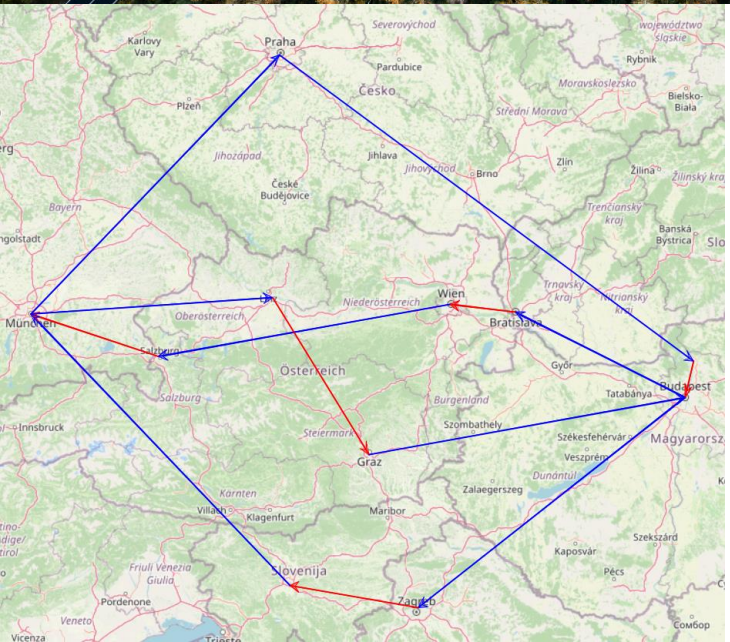
- Mapping and analysis of the processes of the Customer Service department of Carglass
- Identification of bottlenecks in the process and prioritization together with the partner
- Feasibility study and high-level planning of solutions for the first four most urgent painpoints
- Presentation of the potential optimization techniques with corresponding benefit/risk analysis



Customer story – Qamion

Smart vehicle routing

- Automating the route planning process for a fleet of vehicles in FTL transportation
 - AETR agreement compatible
 - National restrictions are included
 - Workflow automation
- Advanced mathematical model of VRP (Vehicle Routing Problem)
 - Automation for saving time
 - Optimization for saving fuel



Nobody will do the planning manually in 10 years.

The time for automation has arrived!

Customer story – TELL Security Drone

Security solutions with drone technology

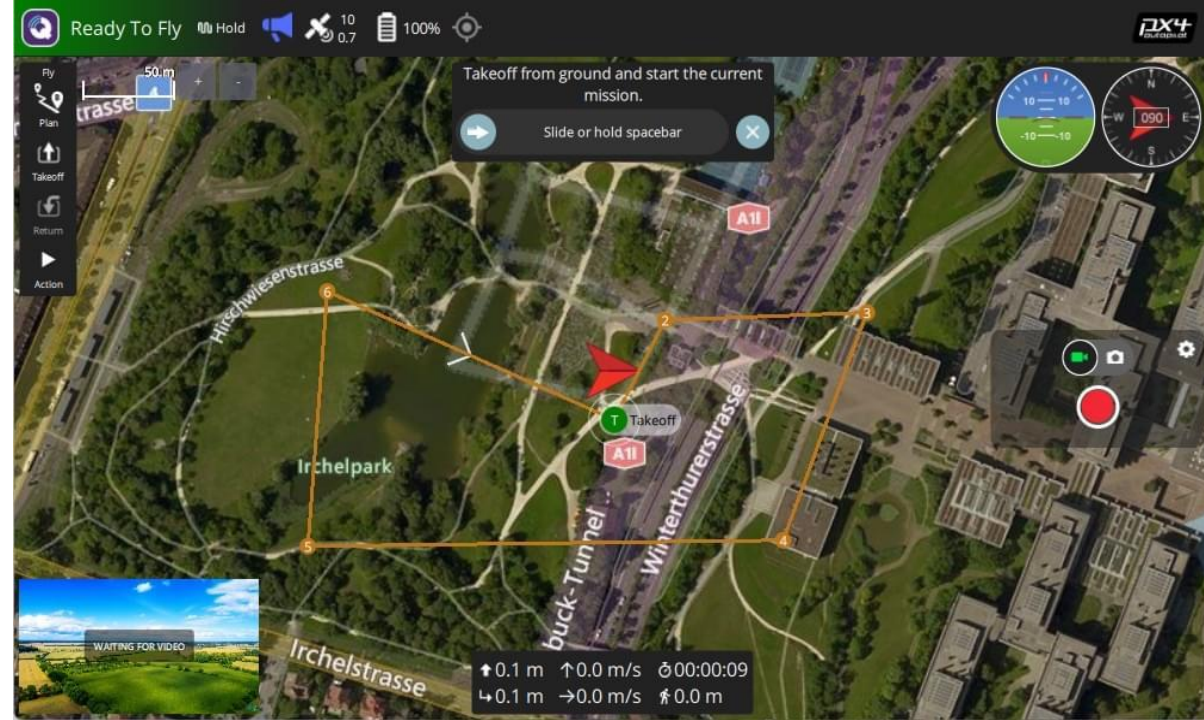
- On going development with TELL security solutions company
- A → Z service: legal operation, drone pilots, IT system, 24/7 support
- Enables near autonomous operation (due to the current drone regulation)
- Never sleeps, never eats, „just working”



Customer story – Airodit CIL (Class Identification Label) study

Supporting customers to comply with EU drone regulations

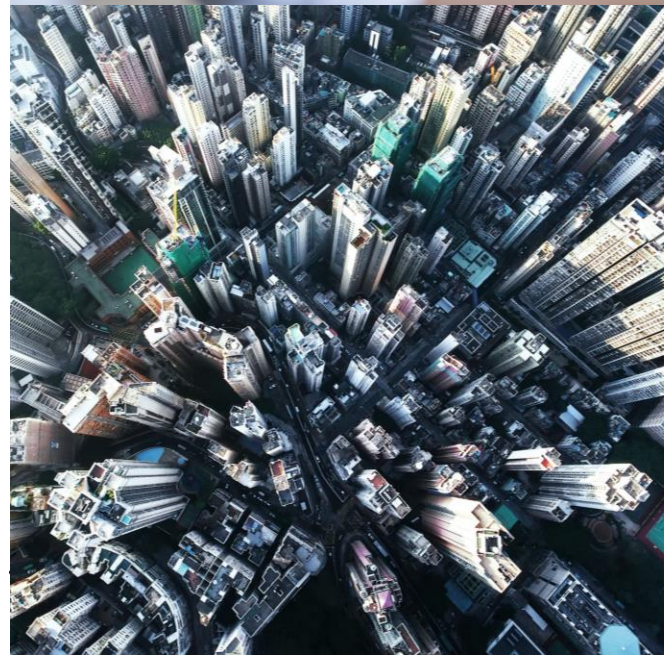
- QGroundControl and PX4 code review with regulation focus
- How to solve the geo-fencing and geo-awareness problem in 27 EU Member States?
- High level development architecture
- (EU) 2019/945, (EU) 2019/947 regulation with CIL focus
 - ED Decision 2022/002/R
 - enPr4709-003 geo-awareness



Customer story – Drone as a carrying platform with AI, CV etc.

Maintenance, Computer Vision, Surveillance

- A → Z service: legal operation above industrial areas, drone pilots, IT system, unique development with drone carrying platform
- RGB(d), Heat camera, IR camera, 4D imaging radar
 - Solar park maintenance
 - Computer vision-based tasks



Customer story – Collaboration with AI Sweden in partnership with Viking Analytics

Applications of Federated Learning in Predictive Maintenance

- Evaluation of different federated learning frameworks
- Conducting decentralized training for 2 different use cases: aircraft engine remaining useful lifetime estimation and bearing fault detection based on vibration signals on AI Sweden private cloud
- Testing and evaluation of different federated learning algorithms
- Testing and evaluation of data privacy methods (differential privacy and homomorphic encryption)

Federated Learning



Customer story – Metalock

Feasibility study for designing, developing and manufacturing of a boring bar control unit

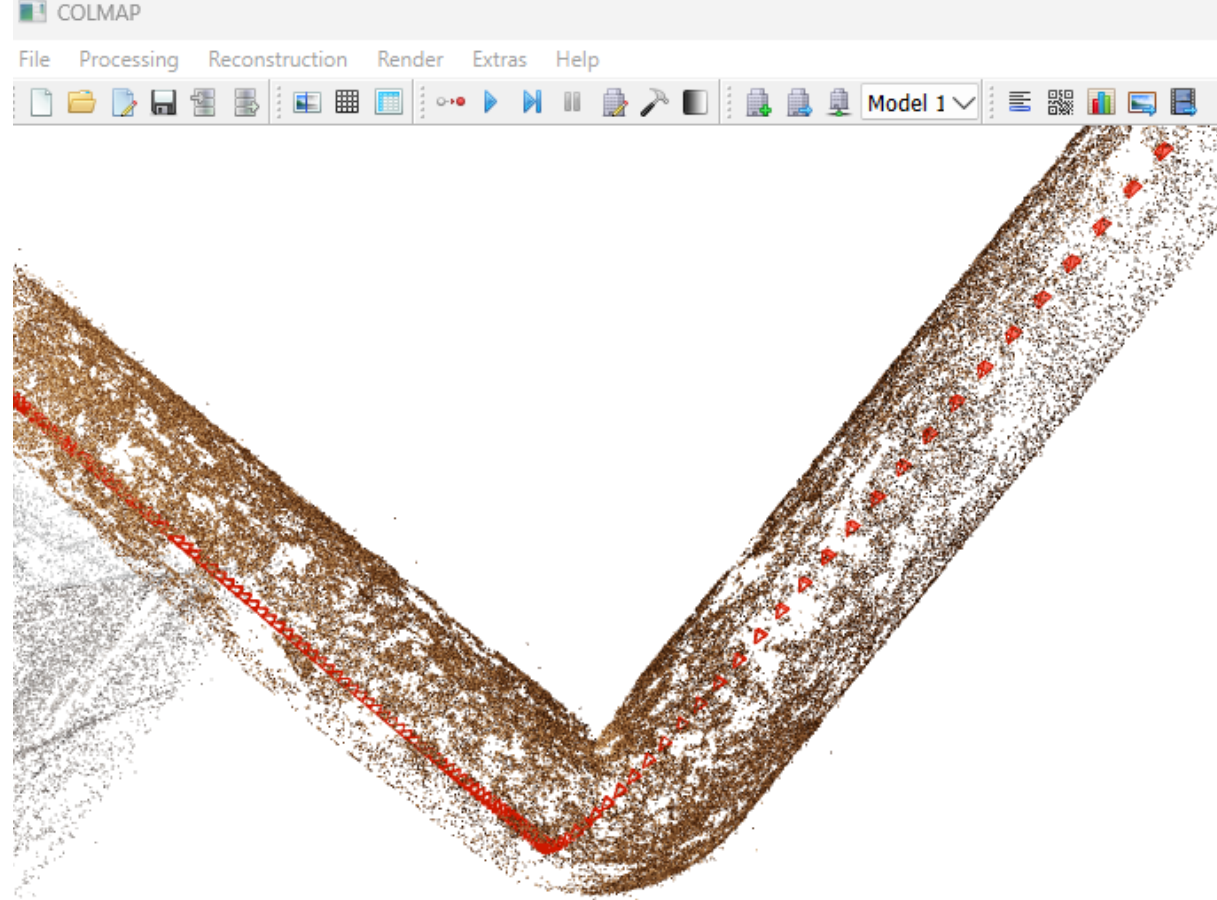
- Preparation of requirements specification
- Conceptual design
- Evaluation of implementation alternatives based on required timeframe, development/manufacturing costs and advantages disadvantages
- Solution recommendation including high level schedule and resource plan



Customer story – Polinvent (Phase 1 of 3)

3D Modelling of Plumbing Systems

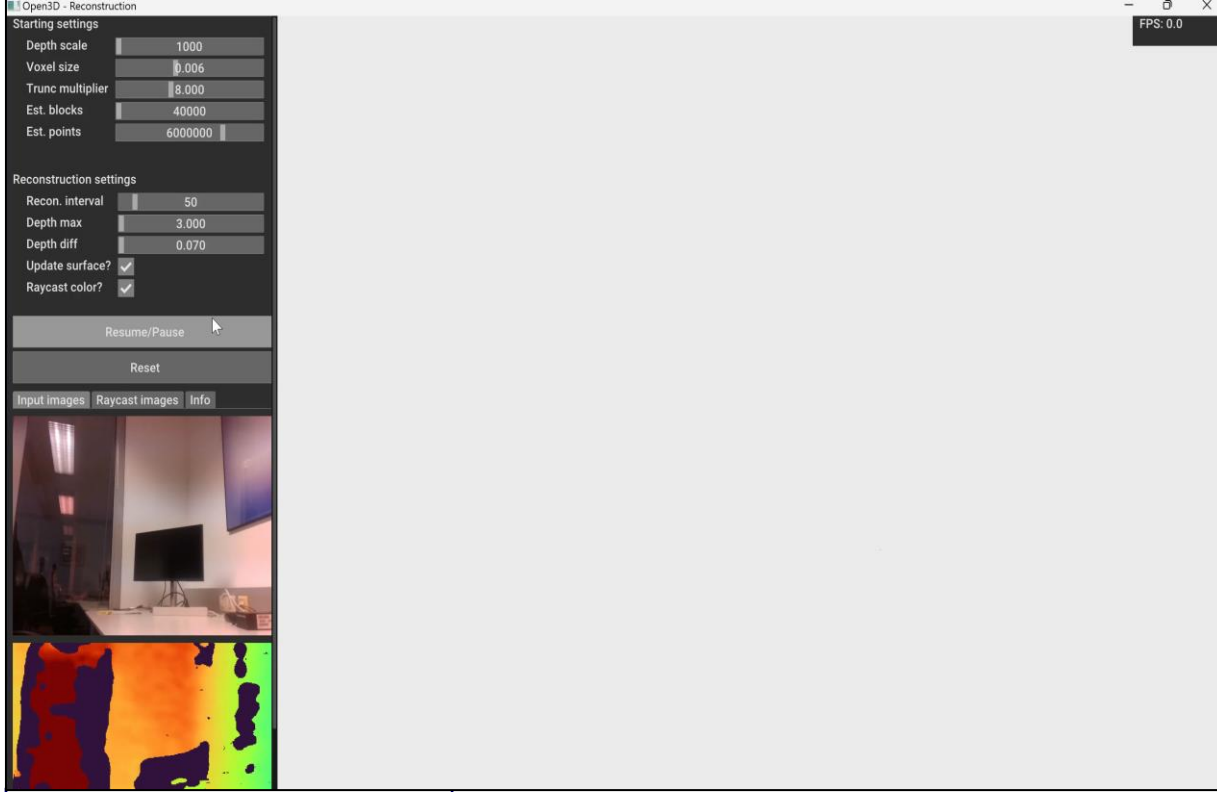
- Creating a 3D model from video feed of a pipe system
- Detecting pipe defects based on RGB images
- Technologies used:
 - SfM: Recovering the 3D structure by image processing
 - NeRF: Generates 3D representations by using advanced machine learning
 - Convolutional Neural Nets: Classifying defects on image



Customer story – Ortoma AB

Real-time pointcloud registration (pre-study)

- **Target:** Improve the positioning accuracy in hip surgery
 - Automatize the collection of 3D measurement points taken during surgery by using RGB-D camera (Intel RealSense D405)
- **Challenge:** Real-time and accurate point cloud-based 3D reconstruction and registration with 3D CT scan
- **Technologies used:**
 - SLAM: Recovering the 3D structure by mapping feature points gathered by camera
 - Open3D: point cloud processing library



Resource allocation assignments

Adding expertise in clients' projects

- Embedded software development of medical devices
- Related to a platform for collaborative robot applications
 - Frontend development
 - Designing testing strategy
 - Execute automated and manual testing





Qamcom is a knowledge-based research and technology company within hardware, software and system development bridging the gap between research, technology and business.