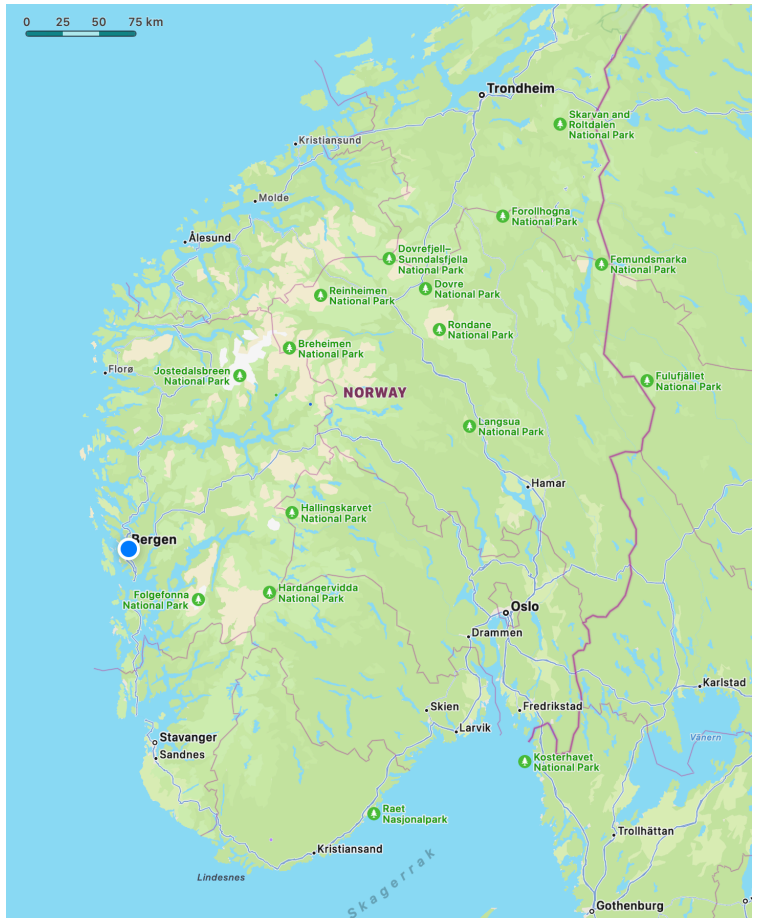
TUAI Kickoff Gliwice

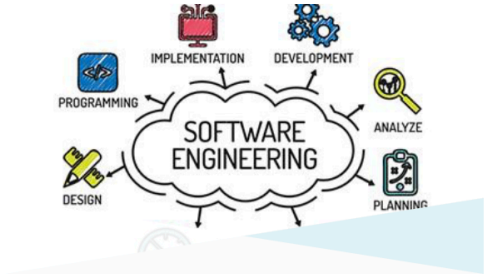
DC 13 - Trustworthy and Reliable Cyber-physical Systems (WP 5)

Volker Stolz and Marcin Fojcik
Department of Computer Science,
Electrical Engineering and Mathematical Sciences
Western Norway University of Applied Sciences

Høgskulen på Vestlandet

HVL ICT: Campuses in Bergen & Førde



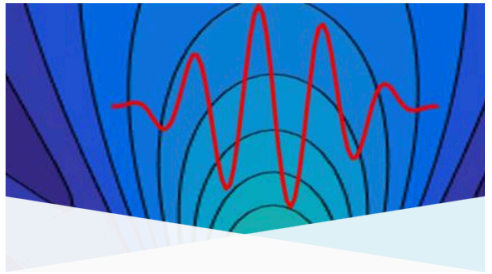


Software Engineering

Data Science and Artificial Intelligence Group

HVL Robotics – research and innovation in robotics

Robot modelling and programming



Sensor network and measurement technology

Health Informatics

PhD Programme in Computer Science: Software Engineering, Sensor Networks and Engineering Computing (ca. 20 professors, 40 PhD students, few post-docs)

Background: Volker Stolz

- Professor in Software Engineering
- Campus Bergen
- PhD students in modelling, verification of embedded systems, testing, digital twins
- Other interests: *formal methods; runtime verification;* ***self-adaptive systems****;* IoT; using LLMs to assist in software engineering

- EU H2020 project “COEMS — Continuous Observation of Embedded Multicore Systems”
- Coordinator & partner in submissions to EU Horizon CL4
- Reviewer for EU Horizon

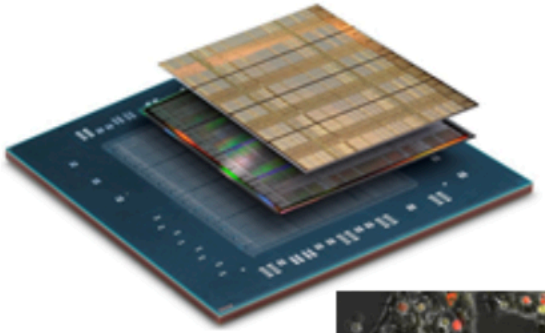
HVL has existing collaboration with partner AIUT through Marcin Fojcik

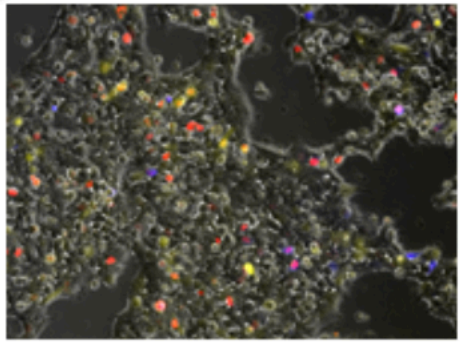
Self-adaptive Systems

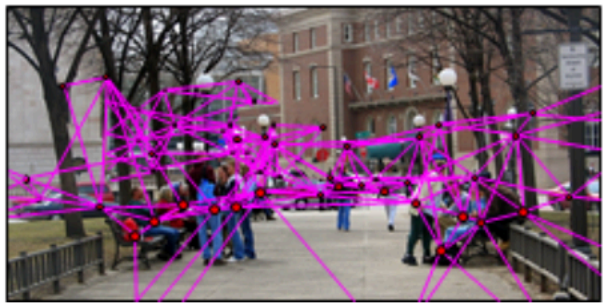
distance estimation, data summarisation (event detection),
selecting areas (network partitioning, channel establishment. . .),
inducing shapes (crowd dispersion, formation control. . .). . . and others!

Aggregate Computing/Programming

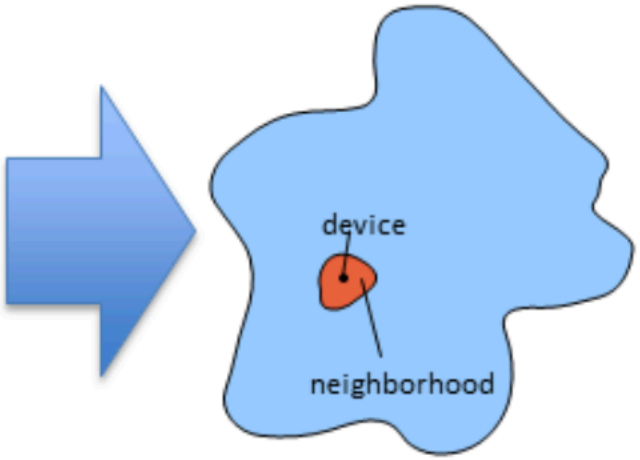
Emerging Computational Platforms







Computational Field Programming Models



Inherently Resilient Distributed Systems

Why are distributed systems hard to deal with?

diverse heterogeneous entities

- different computing power
- sensing and actuation capabilities

We need...

- device abstraction
- multi-platform frameworks
- not too bad so far...

DC13 - Trustworthy and Reliable Cyber-physical Systems

Background:

- Self-adaptive systems: distributed, dynamic, heterogeneous systems
- low-power, proximity-based broadcast communication such as Bluetooth LE and UWB
- with/without centralized coordination

Challenges:

- integrate ML-components into model and framework
- heterogeneous components/ efficient routing of sensor-data for ML to nearest node with free capacity
- consensus among agents on ML-results

Industry application: AIUT AGVs (PL)