



UNIVERSITY
OF ICELAND

M.Sc. Teaching and Research

Software Engineering / Cybersecurity specialisations

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FACULTY OF INDUSTRIAL ENGINEERING, MECHANICAL
ENGINEERING AND COMPUTER SCIENCE



Helmut Neukirchen

Research interests

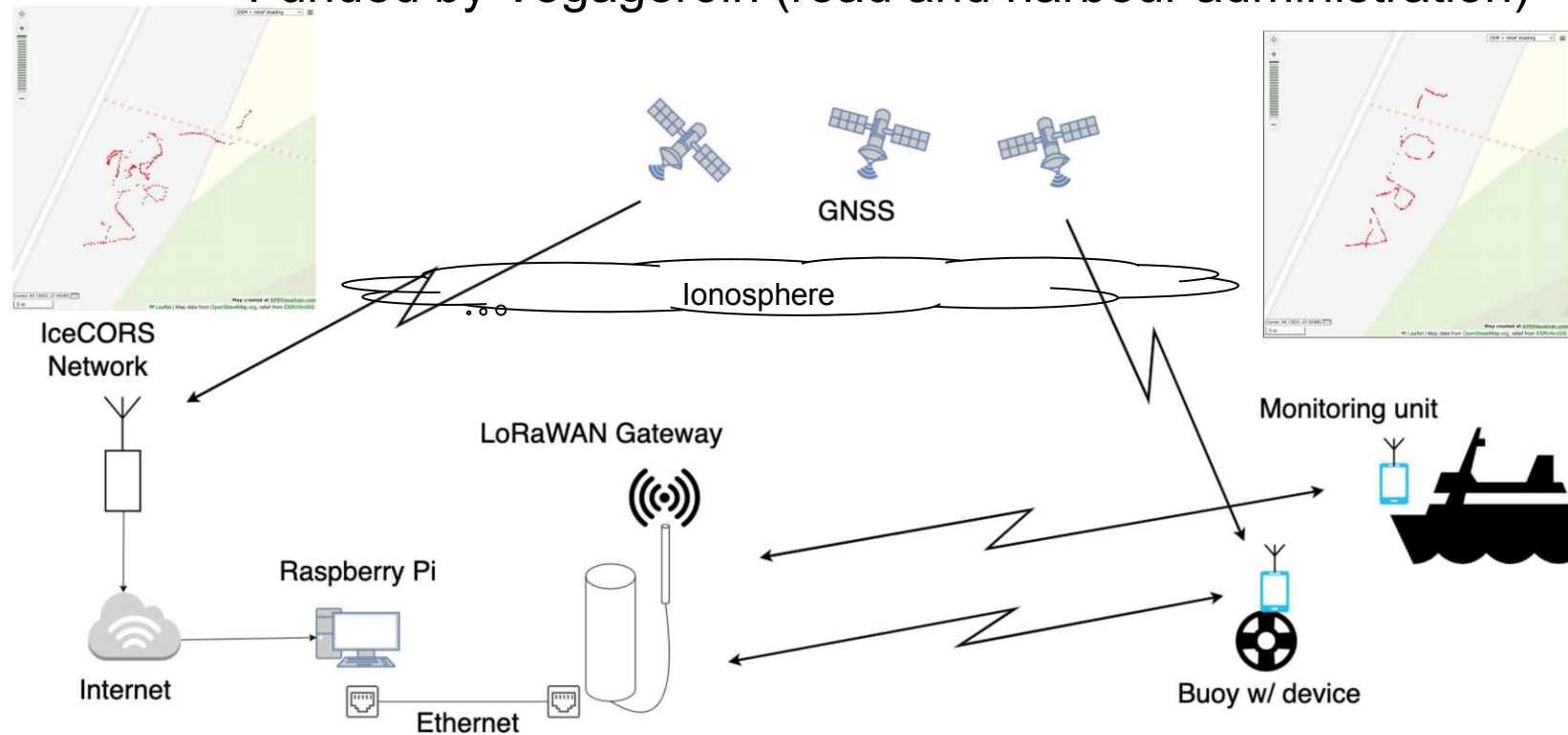
- **Software Engineering, e.g.:**
 - **Software Quality:**
 - Software testing, Metrics, Code Smells, Refactoring, Patterns, Tools.
- **Distributed systems, e.g.:**
 - Cloud computing,
 - eScience (Big Data, Machine learning, LLMs, Supercomputing),
 - Internet of Things (IoT).
- **Cybersecurity**
- **Preferably intersection of the above topics:**
 - **Software Engineering for Distributed Systems, e.g.:**
 - Using LLMs for Software Testing, Using LLMs for Cybersecurity,
 - Developing and testing distributed IoT systems.



Example M.Sc. Thesis topic (completed)

SW & HW using GPS and LoRaWAN wireless communication

- Design and Implementation of a Buoy Positioning and Monitoring System Using Differential GNSS and LoRaWAN
 - <https://skemman.is/handle/1946/42867>
 - Funded by Vegagerðin (road and harbour administration)



Example M.Sc. Thesis topic (completed)

SW & HW using GPS and LoRaWAN wireless communication



Cybersecurity specialisations

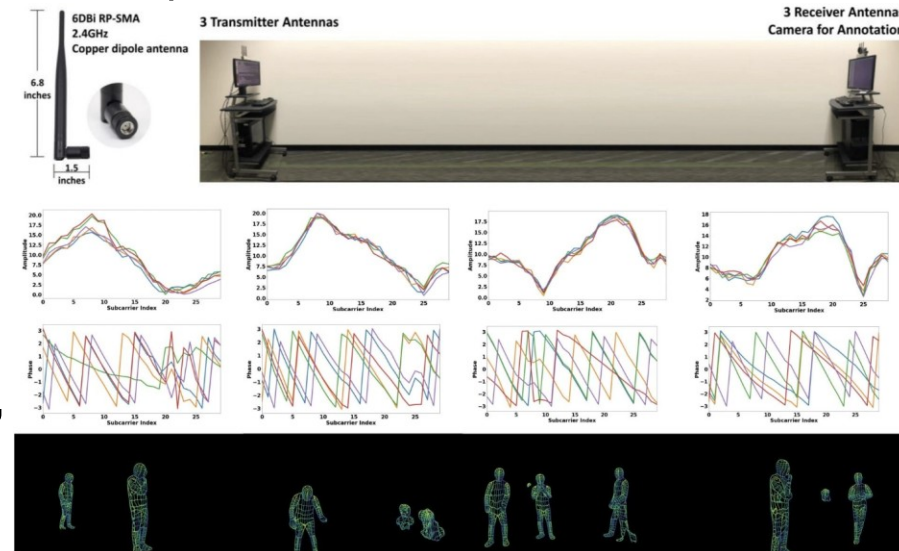
Both in Computer Science M.Sc. and in Software Engineering M.Sc.

- Jointly with Reykjavik University:
 - UoI students can take cybersecurity courses at RU (and vice versa).
 - Frostbyte lab <https://www.frostbyte.is/>
- In contrast to the general CS M.Sc. and in SE M.Sc. programme: mandatory cysec courses (+ in SE: mandatory SE courses). <https://uni.hi.is/helmut/cybersecurity/>



Research Topics:

- LLMs for security,
- Software supply chains,
- Network monitoring,
- Wireless, e.g. body detection & pose estimation using WiFi,
- Smart manufacturing,
- Socio-technical approaches (e.g. resilience),
- Adaptive systems (self-*, e.g. self-healing, self-protecting, self-organising).



Source: <https://arxiv.org/pdf/2301.00250.pdf>