

CV – Per Thomas Hille



Personalia

Name: Per Thomas Hille
Date of Birth: 1972-07-14
Nationality: Norwegian

LinkedIn: [inkedin.com/per-thomas-hille](https://www.linkedin.com/in/per-thomas-hille)
GitHub: <https://github.com/perth>
Resume: <https://perthi.github.io>
Homepage: <http://www.embc.no>

Summary

I have a PhD in instrumentation for nuclear physics from CERN and a master's degree in electronics from the University of Oslo. I have also worked as a researcher at Yale. I have extensive experience with the development and verification of SW projects and embedded systems both as a developer and as a Tech-Lead, Scrum Master, and project manager.

My core technical skills are C ++, embedded Linux and microcontroller programming on STM32 with FreeRTOS. I also have experience in several other areas. In the last couple of years, I have taken a great interest in artificial intelligence and machine learning.

I was security cleared at level "SECRET" and "NATO SECRET" in February 2021.

Core competence

Areas of expertise/project roles

- C/C++, Backend
- C/C++, Embedded Linux
- STM32, FreeRTOS
- Systems engineering
- Agile/SCRUM, DevOps
- Continuous integration & Regression testing, TDD
- Mathematical Modeling, Signal processing
- LabVIEW
- Technical Project Management

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Security Clearance

- Security cleared for level SECRET (Norway) and NATO SECRET, February 2021
- Approved security course, May 2020
- Approved security course in cryptography, May 2020

Employers/Clients (se appendix for details)

Eco Stor Tech Lead, Senior developer, system architect	06.2023 - ongoing
Flekkefjord Elektro Tech Lead, Developer C++, Embedded (STM32)	02.2021 – ongoing
Thales Norway Various projects and technologies, see project descriptions for details.	08.2020-08.2022
Kongsberg Target Systems Scrum Coach, C++ Developer, Embedded (STM32)	02.2019 - 06.2021.
Semcon Devotek Tech Lead SW/Embedded	09.2016 - 02.2020
Kongsberg Norspace Project Manager, Developer	09.2015 - 06.2018
Conceptos Consulting Senior Consultant	01.2014 - 09.2015
Data Respons Project Manager, senior developer, sales	08.2011 - 01.2014
Yale University / CERN Researcher	11.2009 - 07.2011
CERN / University of Oslo Researcher, Project Manager	01.2006 - 11.2009
University of Oslo Teacher: Taught a course on microcontrollers and real-time embedded systems.	01.2003 -11.2003

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Various

1996 – 2005

Freelance WEB developer

Various smaller engagements as a teacher at the University of Oslo

Various jobs / temporary positions as a teacher in upper secondary and upper secondary school

Environmental therapist at Blakstad and Ullevål hospital

Project Experience

Se attachment.

Certifications

2013 PRINCE2 Foundation

2013 PRINCE2 Practitioner

2019 Certified Scrum Master (CSM), Scrum Alliance

2020 Advanced Certified Scrum Master (ACSM), Scrum Alliance

2020 Project Management Professional (PMP)

Education

2005-2009 **CERN / University of Oslo.** PhD in instrumentation and data analysis for nuclear physics.

2003-2005 **University of Oslo:** Master in electronics (instrumentation)

2001-2001 **University of Oslo:** Practical Pedagogical Education (PPU)

2005 **CERN School of Computing:** Scientific software development

Courses

Machine Learning, Data Science & AI (click on the links for certificates)

2025 **Stanford University/Coursera:** [Machine Learning \(3 courses\)](#)

1. [Supervised Machine Learning: Regression and Classification](#)
2. [Advanced Learning Algorithms](#)
3. [Unsupervised Learning, Recommenders, Reinforcement Learning](#)

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2017 **Stanford University/Coursera:** [Machine Learning: Basic course.](#)

2018 **Stanford University/Coursera:** **AI specialization (5 courses)**

1. [Neural Networks and Deep Learning:](#)
2. [Structuring Machine Learning Projects](#)
3. [Hyperparameter tuning, Regularization and Optimization](#)
4. [Convolutional Neural Networks](#)
5. [Sequence Models](#)

Publications

I have 30+ publications within the areas of nuclear physics, analysis and computer science.

The most significant publications can be found on my LinkedIn profile here:

<https://www.linkedin.com/in/per-thomas-hille-phd-28767b11/details/publications/>

A more complete list can be found here:

<https://independent.academia.edu/PerThomasHille>

Various

Tools:

- **Programming/script languages:** C, C++, Python, Rust, Bash, LabVIEW, MATLAB/Octave, Assembler.
- **Data Science:** Python (Keras, TensorFlow). Convolutional Network, Sequence Models, Deep Learning.
- **Operating systems:** FreeRTOS, Linux: Most Linux/Unix variants. Embedded Linux (Yocto based + uClinux). Alle Windows versions.
- **Bootloadere:** Barebox, uBoot, have also written bootloaders for STM32mikrokontrollere.
- **Systems Engineering:** Enterprise Architect, UML/SysML, Requirements management, System Design.
- **Applications/Tools:** Most administrative tools for Linux and Windows. Office365, Jenkins, Jira, Confluence, BitBucket, Enterprise Architect, protobuf, XML, XSD, Docker
- **Protocols:** Canbus, Modbus, ISTOTP-CAN, UART, TCP/IP, UDP
- **Web:** REST API, OpenAPI/Swagger, HTML, CSS, PHP, Apache, JavaScript.
- **Database:** MySQL (MariaDB), PostgreSQL
- **Development tools:** Visual Studio (+ Code for Linux), SVN, GIT, GNU make, STMCubeIDE, Emacs, IAR embedded workbench.

Language

- Norwegian: Mother tongue
- English: Fluent in writing and orally
- Portuguese: Fluent oral

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Military Service

1992-1993 **Hans Majestet Kongens Garde (HMKG)**
Reconnaissance hunter and sniper

Sports

I am an active person who engages in many different activities. I have previously done speed skating at an international level and have, among other things, had Norwegian national record on 3KM for men senior (https://no.wikipedia.org/wiki/Per_Thomas_Hille).

Music

I play piano and am passionate about classical music. My favorite composer is Fryderyk Chopin. I am a recreational pianist, but I occasionally hold concerts.

[Chopin, Waltz Op. 64 no.2. C sharp major](#)

[Chopin, Nocturn Op.9 no.2 E flat major](#)

[Chopin, Waltz op.65 no.1 \(minute waltz\)](#)

[Chopin, prelude Op.28 no.4, e minor](#)

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Project Experience

Eco Stor

06.2023 – ongoing

Role: Tech Lead, Developer, System architect

Description: Eco Stor is a company that creates energy storage systems based on second life batteries from electrical cars. The storage systems implement hardware that makes the battery think that it is still sitting in the car. This has the advantage that it is not necessary to open the car batteries, they can be used “as is” for energy storage. The challenge is that different electrical car manufacturers have different communication protocols, and there is not yet a common standard across the manufacturers. This means that the HW/SW have to support a number of different batteries in a generic way.

My role was/is to build a SW team and apply “best practices” for implementation of the SW portfolio. This included among other things the setup and maintenance of build servers for testing (Jenkins) to facilitate a CI/CD pipeline. Consolidation of existing SW into a common code base. Refactor and improve existing code base which is written in Python. The writing of control SW for the EMS (Energy Management System) in C++. Design and review of a new HW platform. Assessment and validation of candidates + conduct interview for new positions at Eco Stor. System design in Enterprise Architect. Setup and maintenance of JIRA + Confluence. Introducing Agile/Scrum and educating the team.

Technology/Methodology: C/C++, REST-API, Open-API, Modbus, System Engineering (Enterprise Architect), Python, Agile/SCRUM, JIRA, Confluence.

Web: <https://www.eco-stor.com>

Thales Norway

05.2022 – 08.2022

Role: Developer

Description: The project is graded in accordance with the Norwegian Security Act and further details can therefore not be given.

Technology/Methodology: C++, Intel SGX.

Flekkefjord Elektro

01.2021 - ongoing

Rolle: Technical Lead, Developer

Description: R&D project within motor control using Field Oriented Control (FOC). Continuation of project from 2017, (see detailed description on page 3)

Web: <https://fcreate.com/solutions/>

Thales Norway

08.2020 - 03.2021

Role: R&D cryptography

Description: The project is graded in accordance with the Norwegian Security Act and further details can therefore not be given.

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Technology/Methodology: Intel SGX, NASM, cryptography (AES-GSM), C-ABI, ELF, Rust. GNU Assembler.

Thales Norway

11.2020 - 03-2021

Role: R&D IOT for Military Applications

Description: The project is graded in accordance with the Norwegian Security Act and further details can therefore not be given.

Technology/Methodology: STM32 – STM8 product line, FreeRTOS. Protobuf, STMCuebelIDE. cryptography (Ascon + AES-CCM, ChaCha20).

KONGSBERG TARGET SYSTEMS

02.2019 - 08.2021

Role1: Scrum Coach (+ DevOps),

Description: Kongsberg Target Systems makes electronic target targets and is the market leader in Norway. In connection with entering new markets, they want to have better control of their software processes to avoid delays in important deliveries. In this connection, I have been hired to introduce SCRUM / Agile in the company and make recommendations regarding the actual development methodology, especially methodology related to testing and verification.

Technology/Methodology: SCRUM/Agile, Google Test, C++, Jira, DevOps, Continuous integration, regression testing, test driven development.

Role2: Senior Developer

As a continuation of the work as Scrum Coach, I was hired to help with the actual implementation of the new system. This is a cloud solution where updating SW is done within a DevOps regime. I am responsible for developing a custom Linux distribution based on Yocto / Poky. This will run various applications using Docker containers that are updated from a separate cloud service. I am also responsible for quality assurance of existing SW solutions by introducing unit testing, regression testing and continuous integration. This code is written in C ++. Furthermore, I have implemented FW for several STM32 micro controllers that communicate with an embedded Linux over CAN bus as well as ISOTP-CAN with protobuf as protocol on top of as ISOTP-CAN. I have also written bootloaders for the same microcontrollers.

Technology/Methodology: FreeRTOS, CAN-bus, protobuf, ISOTP-CAN, DevOps, Google Test, C++, CI, regression testing, TDD, Linux, Yocto, Docker, DHCP, Network configuration. Jenkins (script-based pipelines)

Web: <http://www.kongsberg-ts.no/en/>

KONGSBERG FERROTECH:

03.2019 – 11.2019

Role: Tech Lead SW/Embedded, Developer, Scrum Master, System design

Description: Kongsberg Ferrotech makes SUVs (Subsea Unmanned Vehicles) for repairing oil and gas lines. A prototype is currently under development and was responsible technical lead for SW and FW for this prototype. The SW / FW system consists of a control system running on a Linux PC top side (on a boat) that communicates with 8 embedded modules in the ROV running FreeRTOS. Communication takes place via an umbilical over TCP / IP with a protobuf protocol. Configuration of the system is done via XML. In addition to being a tech lead, my task

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is to implement the protocol including parsing and validation of XML configuration files as well as all other business logic in, state machines etc. that run top page. The graphical interface is made in QT, I have also been involved in this development.

The programming language for all SW / FW is mainly C ++ with some elements C.

Web: <https://www.kferrotech.no/>

Technology/Methodology: Systems Engineering, Enterprise Architect, QT, C, C++, Embedded (FreeRTOS), protobuf, XML, XSD, Agile/Scrum, Jira, Confluence, Continuous Integration and regression testing, Network socket programming (UDP&TCP).

SEMCON DEVOTEK/Flekkefjord Elektro

06.2017 - 11.2019

Role: Technical Lead, Senior Developer

Description: R&D Project in control technology and motor control using Field Oriented Control (FOC). The project involves making an electro-mechanical winch with a very high efficiency. The winch is so compact that all electronics can fit inside the drum. With high voltages and high power at a small volume, this places very special demands on risk analysis, requirements handling and testing. The system also has very strict real-time requirements due to PWM frequencies that must operate outside the audible range.

I have had the following main tasks in the project.

- Technical Lead / Scrum Master: Requirement's specification, risk analysis, planning of implementation and reporting to the management at Semcon
- System Design using Enterprise Architect
- Control SW in C ++ running cross platform (Linux PC, Linux Embedded Arm + Windows)
- Motor control SW in C ++ running under FreeRTOS on an STM32 MCU
- Monitoring in Python
- Modifications to a Yocto based Embedded Linux distro, including configuration of GPIO, UART, as well as modifications to Device Tree Source / Blob (DTS / DTB)

Web: <https://fcreate.com/solutions/>

Technology/Methodology: C, C++, Python, DSP & Real time Programming, Embedded Linux, DTS/DTB, FreeRTOS, Systems Engineering (UML and SysML), Jira, Confluence

SEMCON DEVOTEK

10.2017 - 04-2018

Role: Adviser within the field of radiation physics

Description: Mama-k, BeamTech. The project aims at an improved method for the use of proton beams in cancer treatment. The system involves creating a control system that allows this to be done significantly more accurately than an existing solution, and thus to a greater extent avoid damaging healthy tissue.

My role was to summarize a "feasibility study" in which I assessed whether the proposed system is technically and practically possible from a physics point of view. In addition, I aided assistance in connection with two patent applications.

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Technology/Methodology: Radiation physics, accelerator physics, regulation technique, simulations in Matlab (Octave), Python, literature and patent search.

09.2015 – 04.2019

KONGSBERG NORSPACE

Role: Technical Project Lead, Developer, SCRUM Master

Description: I was project manager for the development of a test system for the product line at Kongsberg Norspace, which produces equipment for satellite communication. These products are mostly tailor-made. The system must support a wide range of products with many configurable options based on customer specification. A special challenge in this system is to find the balance between complexity and user friendliness for the user of the system, which in many contexts are conflicting requirements.

With a small project team of 4-6 people, it was natural that I also had technical tasks. I was the administrator of the entire server infrastructure for continuous regression, and unit testing as well as source code control and agile development. I was responsible for streamlining the building system for software that consists of over 100 subprojects / modules. Of purely programming tasks, I was responsible for implementing drivers, the state machine for the system, logging, exception handling and various due tasks.

Technology/Methodology: C++/C# .NET, Google test (unit testing), Jenkins, JIRA/Confluence, IVI, QT, Scrum/Agile. Visual Studio, TDD

GE/PRESENS

02.2014 – 05.2015

Role: Principal developer, Project Manager

Description: PRESENS is the market leader in pressure sensors for the oil industry. I was responsible for developing a computer model for pressure and temperature response to a silicon-based pressure sensor. The model was implemented in C++ and has one user interface in LabVIEW and one CLI for Linux. The model is used to calibrate the sensor by loading parameters generated by the model into the sensor and used while to accurately reproduce pressure and temperature on-line with a microcontroller mounted on the sensor. The first part of the job was to improve existing software to automate the entire process of calibration as well as generate test reports in PDF. In phase 2, other types of models were looked at to parameterize the calibration results to improve the accuracy of the sensor, including the use of splines, as well as optimization of the existing model. This work resulted in an improvement in the accuracy of the sensor of about 20%.

Technology/Methodology: C++, LabVIEW, Linear Algebra

DATA RESPONS

04.2013 – 12.2013

Role: Senior developer, Sales

Description: In periods where I have not been on assignment with customers, I have participated in planning and estimation in connection with sales of new projects. I have implemented a common framework (C++) for regression testing and continuous integration

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against different HW platforms from a centralized building Server. The framework has one API against JENKINS on the one hand and one Interface over TCP / IP with password less SSH against various embedded Linux systems on the other side. I have also been responsible for maintenance and support of software developed by Data Respons for existing customers made by developers who have left the company.

VESTAS/OCAS

11.2012 – 04.2013

Role: Project Manager, senior developer, planning and sales.

Description: The Obstacle Collision Avoidance System (OCAS) is a radar warning system for wind farms. The task consisted of creating a re-spin of existing HW, among other things to replace end of life components and to simplify the HW platform by combining the functionality of several separate circuit boards on one circuit board. The system is based on a custom Linux distribution created with Yocto. My task consisted of initial planning and sales, as well as project management in the first phase of the project. I was also responsible for infrastructure for continuous regression and regression testing.

Technology/Methodology: Agile/SCRUM, Confluence, JIRA, Linux(uClinux), Barebox, C, C++

Det Norske Veritas (later HalfWave)

08.2011 – 09.2012

Role: Project Manager, senior developer

Description: ART-GPS (Acoustic Resonance Technology Gas Pipe Scanner) is a verification tool for gas pipelines. The technology is revolutionary in that the quality of gas pipelines can be verified without stopping production. This places special demands on the Embedded platform regarding temperature, vibration, and power consumption because the scanner operates autonomously in the gas lines and is driven by the gas pressure.

My task in the project consisted of two phases. The first phase of the project I led the work write a report on the existing HW / SW platform as well as estimation of the remaining work after the previous subcontractor had failed.

This work resulted in phase 2 of the project, where my employer, Data Respons, was hired to implement the remaining work. I was project manager for a team that consisted of 5-12 developers who implemented FW and SW for the data collection system. Systems were based on two different Embedded Linux platforms.

In addition to the role as project manager, I also worked as a developer in periods where the project was scaled down in anticipation of investors and there was therefore no need for me to work full time as a project manager.

Then I was responsible for infrastructure for continuous integration and regression testing (Jenkins, JIRA, FishEye). I also implemented a test framework in C ++ for platform verification.

The project concluded with a successful pipe scan from Kårstø to Statfjord B in October 2012 and was one of the largest projects for Data Respons in 2012. The product is currently in full operation.

The HW platform was based on Embedded Linux with two different Linux platforms.

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- A supervisory system with uClinux on a Blackfin processor.
 - A data collection module based on a Linux distribution from Freescale (NXP) and IMX.6
- They made project-specific modifications to both embedded Linux solutions on root file system, kernel, bootloader + some modifications of existing drivers. Many of these modifications were made by me.

Web: <http://www.halfwave.com/technology/art-scan>

Technology/Methodology: C/C++, Agile/SCRUM, Confluence, Jira, Embedded Linux (uClinux), Barebox, Buildroot, uBoot, QT, Make.

YALE University /CERN

11.2009 – 07.2011

Role: Researcher, shift leader, Developer.

Description: I was involved in computer simulations (C++) and analysis of experimental data for the "EMCAL Physics Performance Report" which was an important document in the work of obtaining funding for the project. Among other sources from the US Department of Energy. The simulation work used GRID computing against data centers in Livermore (US), Catania and CERN, among others, consisting of non-homogeneous PC farmers running various distributions of Linux. I had the main responsibility for evaluating different methods for analysis of raw data. I also worked with the setup and installation of experimental equipment and analysis of calibration data from three of the accelerator complexes at CERN; Proton Synchrotron (PS), Super Proton Synchrotron (SPS) and the Large Hadron Collider (LHC). By combining test data from these 3 different accelerator systems, I managed to improve the calibration of EMCAL by 12%.

In addition, I have also worked both as a shift leader and crew on the ALICE experiment at the LHC during the initial tests of the detector and LHC accelerator complex in 2011.

Technology/Methodology: C/C++, GRID computing, Neural Networks, Statistical signal processing.

YALE University

01.2009 – 10.2009

Role: Researcher, Implementation of embedded Linux Software (ARM/uClinux) & analyses software, reporting to the US Department of Energy (DOE)

Description: I was responsible for calibrating one of the particle detectors, EMCAL, for the ALICE experiment at CERN with cosmic rays (muons). EMCAL is the electromagnetic calorimeter for the ALICE experiment (The Big Bang experiment). EMCAL measures high-energy gamma rays that are an important observable in Big Bang cosmology. It is common to calibrate such detectors with cosmic rays that hit the earth at a rate of about 100 / m².sec.

My main responsibility was setting up experimental equipment and implementing software for detector control (embedded Linux) and data analysis (C / C++) for filtering and analysis of relevant detector signals usable for calibration. My team consisted of three engineers and involved the supervision of 2 students who had different tasks on the project.

Technology/Methodology: Linux, Embedded Linux, C/C++, Python, Statistical signal processing.

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CERN

01.2007 -12.2008

Role: Researcher, software coordinator

Description: I worked on the implementation of analysis software for ALICE High Level Trigger (HLT) at CERN. HLT is a PC farm consisting of about 2000 PCs with dual quad core AMD processors connected with an InfiniBand back-bone and with Ubuntu Linux as operating system. The system analyzes on-line data that is read in via about 500 optical links from the experiment with a data rate of up to 100 GB / s.

My tasks consisted of creating computer programs for simulations (C ++ with a user interface in LabVIEW for configuration of simulation parameters), as well as analysis and compression algorithms (C ++) to achieve a maximum storage rate of 1.25 GB / s. This is very performance-critical software that requires a lot of optimizations. Part of the work consisted of developing a novel method for estimating signal parameters from over sampled detector signals that allows near optimal estimation 120-1000 faster than traditional methods. The method was first justified theoretically and then implemented in C ++. The method is currently part of the standard analysis software at CERN. The subproject consisted of 3-5 developers, while the HLT project involved about 80 developers and engineers.

Technology/Methodology: Linux, C/C++, LabVIEW

CERN

01.2006 – 09.2007

Role: Commissioning Coordinator

I led the work with the commissioning of the electronics for the Photon Spectrometer (PHOS) which is one of the detector parts of the ALICE experiment at CERN.

The work consisted of debugging electronics, measuring noise conditions, verifying signal integrity, implementing software for detector control and monitoring (Embedded Linux, C / C ++). Testing and verification of firmware for checking ASICs that control the reading of experimental data.

Technology/Methodology: Linux, Embedded Linux, C/C++.