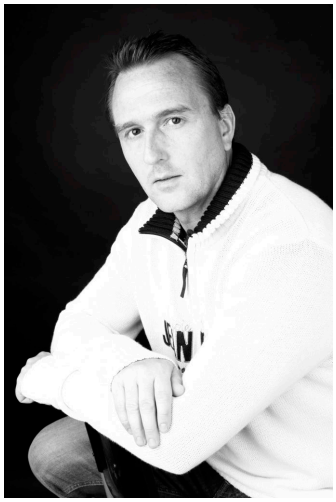
# CV – Per Thomas Hille



## Personalia

| | |
|---|---|
| Name: | Per Thomas Hille |
| Date of Birth: | 1972-07-14 |
| Nationality: | Norwegian |
| GitHub: | https://github.com/perthi |
| URL: | 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 everything related to Data Science and Machine Learning, especially artificial intelligence, and have updated myself a professionally in this field.

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

## Core competence

### Areas of expertise/project roles

- C/C++, Backend (C++11 - 17)
- C/C++, Embedded Linux
- STM32, FreeRTOS
- Yocto
- Agile/SCRUM, DevOps
- Continuous integration & Regression testing, TDD
- Mathematical Modeling, Signal processing
- LabVIEW
- Socket programming (Linux)
- Technical Project Management

# CV – Per Thomas Hille

## 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)

**Thales Norway**
C++ **08.2020-02.2021**

**Flekkefjord Elektro**
Tech Lead, Utvikler C++, Embedded (STM32) **02.2021 – 03.2022**

**Thales Norway**
R&D, cryptography + Embedded **08.2020 - 02.2021**

**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** **09.2015 - 06.2018**
Project Manager, Developer

**Conceptos Consulting** **01.2014 - 09.2015**
Senior Consultant

**Data Respons** **08.2011 - 01.2014**
Project Manager, senior developer, sales

**Yale University / CERN** **11.2009 - 07.2011**
Researcher

**CERN / University of Oslo** **01.2006 - 11.2009**
Researcher, Project Manager

**University of Oslo** **01.2003 -11.2003**
Teacher: Taught a course on microcontrollers
and real-time embedded systems.

# CV – Per Thomas Hille

**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
2014 Project Management Professional (PMP), Renewed in 2020
2019 Certified Scrum Master (CSM), Scrum Alliance
2020 Advanced Certified Scrum Master (ACSM), Scrum Alliance

## Education and Courses

2005-2009 **CERN / University i 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

## Kurs

**Machine Learning, Data Science & AI**

2017 **Stanford University/Coursera:** Machine Learning
https://www.coursera.org/account/accomplishments/verify/DPXQXYYWEZAC
Basic course

2017 **Stanford University/Coursera:** Neural Networks and Deep Learning
https://www.coursera.org/account/accomplishments/verify/J4FWSENS7N9N

*AI specialization, part 1

2017 **Stanford University/Coursera:** Structuring Machine Learning Projects
https://www.coursera.org/account/accomplishments/verify/B7KHBVAVH6PC
*AI specialization, part 2

2017 **Stanford University/Coursera:** Improving Deep Neural Networks Hyperparameter tuning, Regularization and Optimization
https://www.coursera.org/account/accomplishments/verify/XG95Z5XJPHSH
*AI specialization, part 3

2018 **Stanford University/Coursera:** Convolutional Neural Networks
https://www.coursera.org/account/accomplishments/verify/YHRYHYFHTZJZ
*AI specialization, part 4

2018 **Stanford University/Coursera:** Sequence Models
https://www.coursera.org/account/accomplishments/verify/AXLCU2ASF7JS
*AI specialization, part 5

* Courses 1 - 5 in AI constitute a complete specialization in artificial intelligence and are considered one of the most recognized educations in Data Science.

## Diverse

**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 STM32mikrokontrollers.
- **Systems Engineering:** Enterprise Architect, UML/SysML, Requirements management, System Design.
- **Applications/Tools:** Most administrative tools for Linux and Windows. Office365, MS-Project, Jenkins, Jira, Confluence, BitBucket, Enterprise Architect, protobuf, XML, XSD, Docker
- **Protocols**: Canbus, ISTOTP-CAN, UART, TCP/IP, UDP
- **Web:** Wordpress**,** HTML, CSS, PHP, Apache, JavaScript.
- **Database:** MySQL (MariaDB), PostgreSQL
- **Development tools:** Visual Studio (+ **C**ode for Linux), SVN, GIT, GNU make, STMCubeIDE, Emacs, IAR embedded workbench.

**Language**

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

- Portuguese: Fluent oral

**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 run speed skating at an international level and have, among other things, had Norwegian national record on 3KM for men senior.

**Music**
I play classical piano and am passionate about classical music.

# Projects – Per Thomas Hille

## Project Experience

**Thales Norway** **05.2022 - ongoing**
**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.

**Flekkefjord Elektro** **01.2021 - 04.2022**
**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)

**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.
**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, STMCuebeIDE. 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 I am 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 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 Three Source / Blob (DTS / DTB)

**Web**: https://fecreate.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.

**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.

# Projects – Per Thomas Hille

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

**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 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++

# Projects – Per Thomas Hille

**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 a 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.
• 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.

**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 optimization. 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 involves about 80 developers and engineers.

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

# Projects – Per Thomas Hille

**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++.