Eirik **Marthinsen**

Software developer/physicist

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Father, husband, hobby skier and passionate software developer

Summary

Software developer/Physicist with over 12 years experience. Mainly developing multiphysics simulation tools used in the oil and gas industry for simulating fire and fire response on process equipment. Responsible for building, testing, automation (DevOps), code analysis as well as implementing mathematical models.

Using C++ as my main language, and Python for supporting libraries and small tasks. I strive to deliver fast, correct, maintainable following the latest standards.

Passion for technology, with broad range of technical skills. I'm patient and like to work on complex problems. I'm focused on details and seldom give up before I'm satisfied. As a colleague I'm nice, positive, hard working and eager to help my team deliver high quality code.

Skills

Programming C/C++ • Python • Rust • LaTeX • Bash
Techical skills Git • Linux/Windows • Jenkins • Visual Studio • Simulation • 3D-graphics • Mathematical modeling
Languages Norwegian (native) • English (fluent)

Projects

Brilliant / VessFire (C++) — *Petrell, etc* — *2012 - Present*

Development of inhouse multiphysics (CFD++) simulation engine

- Adding features, thermodynamic models, command parsing, binary result file IO, +++
- Responsible for testing, automation (Jenkins) and build system etc.
- Modernizing legacy C++ code to modern safe and performant C++20 code (Clang-Tidy, etc)
- Builing with modern CMake, using vcpkg package manager
- Unit testing with both GoogleTest and Catch
- Implementing new license system with OAuth2 using cpprestsdk
- Cross platform Windows/Linux, compiling with Intel, MSVC, GCC and Clang
- C++ libraries Eigen/MKL, SQLite, CppRestSDK, SQLite, Curl, GoogleTest, Catch
- Using tools like Visual Studio, Clang-Tidy, Clang-Format, fuzzers and sanitizers

PyBrf (Python) — *Petrell, etc.* — *2018 - Present*

Python package with mulutiple command line tools for Brilliant simulations and result analysis

- Binary result file parser using NumPy to store large data sets
- Using modern Python 3.12
- Extensively tested with PyTest
- Ensure high code quality with static analysers like PyLint, MyPy, Black
- Using Pandas and Matplotlib to analyze simulation data

BrilliantGUI / VessFireGUI (Qt/C++) — *Petrell, etc.* — *2018 - Present*

Development of simulation case editor and result viewer (3D visializations and graphs)

- Upgrade legacy codebase from Qt4 via Qt5 and finally to Qt6
- 3d visualization with Qt OpenGL, plots with QwtPlot

Fire Integrity Analysis of Flanges (Python, Brilliant, C++) *Diff. petroleum companies*
CREATE 3D PARAMETERIZED SIMULATION MODELS AND ANALYZE THE RESULTS *2017 - 2020*

- Automate the whole process of generatiing simulation models and run simulations (Python)
- Result analysis and presentation with Python using NumPy and Matplotlib
- Import from and export to Excel using python with xlsxwriter

Rupturing of pipes, High Temperature Material Testing (Python) *Oil and gas company*
ANALYZE EXPERIMENTAL VIDEOS OF PIPES EXPOSED TO FIRE TO *2016 - 2017*

- Using Python with OpenCV to fetch video file and read each frame
- Analyze each image frames brightness to detect pipe edges

Work Experience

Petrell AS *Trondheim/Oslo, Norway*
SENIOR ENGINEER *2012 - Present*

- Developing inhouse multiphysics simulation software using C++/Python
- Performing fire-, structural integrity- and CFD simulations with the inhouse softwares Brilliant and VessFire
- Customer support, license

Internships at Petrell, Idéportalen, St. Olavs *Trondheim, Norway*
2008 - 2011

Education

NTNU *Trondheim, Norway*
MASTER OF SCIENCE IN APPLIED PHYSICS *2006-12*

- Master thesis: *Modelling of thermal radiation for use in fire simulations* (at Petrell)
- Specializing in numerical physics
- Broad background in mathematics, physics, and data science.