Baptiste MOUGINOT

Scientific Consultant

BaM Scientific Consulting

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Nuclear Physics, Neutronics, Scientific Software Development

Skills Set

Simulations :

Fuel Cycle: Cyclus, CLASS
Burnup: MURE, OpenMC
Neutronic: OpenMC, MCNP, DAGMC, Geant4, FRENSIE
Other: LISE++, SRIM, PyNE

Management :

Training, Tutoring, Workshops

Languages : English (bilingual)

Softwares :

Version Control: Git, Github, SVN, GitLab
Continuous Integration: Circle-Ci, Github, Travis
Virtualisation: Docker, VMWare
IDE: VSCODE, GDB, PDB, Valgrind
Cluster: QSUB, HTCondor
Development: C/C++, Python, sh/bash script, Cython

Scientific :

Data analysis, Machine Learning,
Error propagation

Experiences

Scientific Consultant Freelance — 2022 - Present

Scientific software development, CI/CD, simulation and data analysis

- **UW-Madison**: LLNL-funded project to explore introduction of targeted isotopes into the commercial nuclear fuel supply to support nuclear non-proliferation (~1 month, 2023)
- **NAAREA** (7 contracts, 2022-2024) :
  - Catia Geometry to OpenMC interface development - Python (1 month, 2022)
  - Continuous extraction during depletion with openMC - Python (1 month, 2023)
  - Training, support and implementation of software and scientific analysis best practices (5d/m, 2023) (5d/m, 2024)
  - Analysis of the radionuclide accumulation and flow through gaz collection on a reactor cycle (1 month, 2023) (10d, 2024)
  - Allowing materials differentiation when loading multiple time the same DAGMC Geometry in OpenMC (1 month, 2024)
- **First Light Fusion** : Targeted development in OpenMC (5x2h, 2023-2024)
- **PROXIMA** : Bug correction and streamline dependencies compilation for DAGMC (4d, 2024)
- **MIT** : Implementing missing capabilities in the ATTILA file reader of the MOAB library (12d, 2025)
- **HEXANA** : Refactoring and improvement of the inhouse python simulation framework. (20d, 2025)
- **Long Run Ventures**: Review and provide a technical analysis about a SMR startup (4d, 2025)

Neutronic Engineer Framatome, Lyon — 2021 - 2022

- Nuclear fuel neutronic simulation (deterministic, 3D core and 2D infinite medium)

Assistant Research Scientist University of Wisconsin-Madison - Dept. of Engineering Physics, (USA) — 2015 - 2021

- Co-Principal Investigator : Integrating Nuclear Analysis into the Design of Fusion Energy Systems
- Nuclear Non-proliferation, uncertainty propagation in Cyclus, Enrichment cascade modelisation
- Software development and associated CI/CD (Cyclus/PyNE/DAGMC/FRENSIE)
- Performed fuel cycle simulations (cyclus) and analysis in support of the DOE Fuel Cycle Option Campaign

Research Scientist Laboratoire Subatech (CNRS), Nantes, France — 2012 - 2015

- Development (C++) of the fuel cycle simulation simulator CLASS
- Fuel fabrication and depletion models (polynomial, neural networks)

Postdoctoral Researcher Laboratoire Subatech (CNRS), Nantes, France — 2011 - 2012

- Neutronics calculations (MCNPX, MURE) dedicated to the dimensioning of an Accelerator Driven System reactor

Research Assistant (French Ministry of education PhD fellowship), — 2007 - 2010

Institut de Physique Nucléaire d'Orsay, Orsay, France

- Simulations, nuclear experiments, data analysis

Qualification

- R&D expert certification French Ministry of higher Education and Research — 2023 - 2025
- Certified "Software Carpentry Instructor" https://carpentries.org — 2019
- PhD, Nuclear Physics (*Summa cum laude*) Université Paris XI, France — 2007 - 2010
- Magistere degree (BS - MS) in Fundamental Physics Université Paris XI, France — 2004 - 2007

Scientific Communication

h-index = 12 (Web of ScienceTM / Google Scholar), 21 publications, 32 Conférences/workshop (21 proceedings)