

Giang Bui

Computational Combustion & CFD | Industrial R&D | Research Engineering

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Profile

PhD researcher specializing in computational combustion and CFD simulations for low-carbon energy systems. Experienced in combustion model development, high-performance computing (HPC), and validation of numerical results against experiments through research projects at IFPEN, TNO, and Aalto University. Interested in industrial R&D and research engineer roles involving CFD, thermal-fluid systems, combustion, hydrogen, and alternative fuels.

Technical Skills

CFD and modelling: CONVERGE CFD, STAR-CCM+, ANSYS Fluent, COMSOL; Turbulence Modelling (RANS, LES); Heat Transfer, Thermodynamics, Reaction Kinetics; Numerical Methods (FVM, FEM).

Programming and scientific computing: Python, C++, MATLAB, Cantera, Linux, Bash, Git, HPC workflows, numerical post-processing.

Languages: Vietnamese – Native, English – Fluent (IELTS 8.0), French – A2 (currently learning).

Experience

Doctoral Researcher

Nov 2025 – Present

IFP Energies nouvelles (IFPEN)

France

- Develop and integrate the Thickened Flame Model (TFM) and Partially Stirred Reactor (PaSR) model in the CONVERGE CFD source code for multi-regime combustion modelling.
- Validate the hybrid TFM–PaSR formulations using atmospheric- and high-pressure hydrogen burner test cases (HYLON and MICADO).
- Evaluate the reliability of the flame index for identifying different combustion regimes under high-pressure gas turbine conditions.

Powertrains Intern

Jul 2024 – Sep 2025

TNO, Netherlands Organisation for Applied Scientific Research

Netherlands

- Built 3D CONVERGE CFD simulations of a single-cylinder engine and validated numerical predictions against measured in-cylinder pressure and apparent heat-release rate.
- Investigated mixture formation (evaporation, mixing) and burning characteristics of methanol port fuel injection (PFI).
- Assessed the effects of methanol substitution ratio, injection timing, and injection location on engine efficiency and emissions.
- First-authored a peer-reviewed *Fuel* article on methanol-air mixture formation and combustion in a large-bore, dual-fuel marine engine at low load.

Research Assistant

Jun 2021 – Feb 2023

Energy Conversion Group, Aalto University

Finland

- Conducted STAR-CCM+ CFD studies of heavy-duty methanol-diesel engine, including the effect of diesel injection location on engine performance.
- Built Python/Cantera workflows for 0D well-stirred reactors and 1D freely propagating flames using gasoline surrogate chemistry.
- Performed brute-force sensitivity, reaction-pathway, and heat-release analyses for toluene primary reference fuel combustion.
- Contributed to a CIMAC 2023 conference paper and first-authored a peer-reviewed *Fuel* article on super-adiabatic flame temperature.

Teaching Assistant

Aalto University and Eindhoven University of Technology

Sep 2021 – Jun 2025

Finland / Netherlands

- Tutored students across chemically reacting flow, thermodynamics, fluid mechanics, physical chemistry, organic chemistry, and general chemistry laboratory courses.

Education

PhD, Mechanical Engineering

IFP Energies nouvelles (IFPEN)

Expected Nov 2028

Started Nov 2025

- Thesis: *Large-eddy simulation of non-premixed high-pressure hydrogen combustion: application to a gas turbine.*
- Research focus: hybrid TFM–PaSR modelling for multi-regime combustion in high-pressure gas turbines, in collaboration with ONERA.

Master of Science, Mechanical Engineering

Eindhoven University of Technology (TU/e)

Aug 2023 – Aug 2025

GPA: 8.8/10, cum laude

- Thermo-Fluid Engineering, Power & Flow; thesis grade: 9/10.
- ALSP and Holland Scholarship recipient.

Bachelor of Science, Chemical Engineering

Aalto University

Sep 2020 – Jun 2023

GPA: 4.82/5, honours

- Minors in Computational Engineering and Energy Technology; thesis grade: 5/5.
- Full-tuition scholarship recipient.

Publications

- G. Bui**, K. Zoumpourlos, C. Bekdemir, and B. Somers, "Numerical investigation of methanol-air mixture formation and combustion in a dual-fuel marine engine at low load," *Fuel*, vol. 413, 138208, 2026.
- G. Bui**, A. Bhattacharya, O. Kaario, V. Vuorinen, R. Tripathi, and T. Sarjovaara, "On the super adiabatic flame temperature (SAFT) of toluene primary reference fuels," *Fuel*, vol. 335, 126989, 2023.