

## GRAHAM DANNY KOYEERATH

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### AREA OF INTEREST

CFD | Fluid mechanics | LBM | Multiphase flows | Thermodynamics | Topology optimization | High Performance Computing

### SOFTWARE

C/C++ | CUDA | MATLAB | Python | Linux based environment | SolidWorks | ANSYS Fluent

### WORK EXPERIENCE

- Assistant Professor (Adhoc) | Fr. Conceicao Rodrigues College of Engineering | July 2025 – present

### EDUCATION

- PhD (Mechanical) | Nantes Université | 2018 – 2024
- MS (Thermal Science and Energy) | Polytech Nantes, Nantes Université | 2017 – 2018 | GPA: 14.03/20
- MTech (CFD) | UPES, Dehradun, India | 2016 – 2018 | GPA: 7.97/10
- BE (Mechanical) | University of Mumbai | 2012 – 2016 | GPA: 7.18/10
- HSC (12<sup>th</sup> grade) | Utkarsha Vidyalaya and Junior College | 2011 – 2012 | Marks: 81 %

### DOCTORAL RESEARCH TOPIC

- Topology optimization in interfacial flows using the pseudopotential model | September 2018 – June 2024 | Doctoral thesis, LTeN, Nantes Université | <https://theses.hal.science/tel-04743730>
  - Derived (and implemented in code) adjoint-state models (corresponding to the multiphase LBM model) for topology and wettability optimization tool for interfacial flows.
  - Successful in maximizing the velocity of a droplet on horizontal and flat surface upto 44% by the modifying the wettability distribution (using a *multiscale* optimizer).
  - CUDA C codes for simulation, Python codes and Paraview for visualization.

### PROJECTS, PAPERS AND CONFERENCES

- The droplet race: Optimization of a wettability gradient surface (WGS) | March 2024 | Physics of Fluids journal | <https://doi.org/10.1063/5.0191507>.
  - Searched for an optimized wettability profile on a WGS using a *multiscale* optimizer.
  - Achieved up to 44% improvement in droplet velocity depending on the droplet size.
- LBM simulations of graded Gas Diffusion Layer for PEMFC applications | July 2021 | Presented at online conference, 17<sup>th</sup> ICMMEs.
  - Studied the invasion of liquid *fingers* into a coarser porous region (PR) from a finer PR at low capillary numbers.
  - We concluded that MCMP model is well suited for capturing the transient nature of the liquid front.
- Aerodynamic analysis of car body for reducing drag forces | August 2015 - April 2016 | Final year project, B.E., University of Mumbai.
  - Gained insight into the wake of a car along with evaluation of decrease in drag due to addition of lip spoiler or conversion to fastback design.
  - SolidWorks for building a CAD model, ANSYS Fluent for the modeling physics of fluids
  - Published paper: <https://www.iosrjournals.org/iosr-jmce/papers/vol13-issue3/Version-1/R130301114118.pdf>

### REFERENCES

- Bruno AUVITY | Professor, Nantes Université | bruno.auvity@univ-nantes.fr | +33 240683149 (n° internal 483149)
- Christophe JOSSET | Assistant Professor, Nantes Université | christophe.josset@univ-nantes.fr | +33 240683138 (n° internal 483168)
- Yann FAVENNEC | Assistant Professor, Nantes Université | yann.favennec@univ-nantes.fr | +33 240683138 (n° internal 483138)

### PERSONAL PROFILE

Date of birth: 04<sup>th</sup> Nov 1994

Nationality: Indian

CON : Conversational

Hobbies: Chess | Badminton | Cycling

Languages: English | Hindi | Marathi | French (CON) | Malayalam (CON)