

Ahmed Basil KOTILINGAL

Paris, France

+33 614744006

basilkotilingal@gmail.com

Technical Skills

- Computer Languages:
 - C
 - C++
 - Python
 - Java Script
- High Performance Computing
 - HPC Programming C/C++
 - Cuda
 - OpenMP
 - MPI
 - Performance Analysis
- Compiler Design
 - Lexer, Parser Development
- Graph Analysis
 - Mathematical foundations
 - Algorithms
- Data Structure
 - Low Level Database management
 - Block-based & Cell-Based AMR Data Structure
 - Surface Mesh (Half Edge Mesh)
- Computational & Data Analysis:
 - Python programming for Image Processing
- Presentation & Communication:
 - Strong scientific reporting and presentation skills

Achievements

Eligibility for Inspire Scholarship

GATE Qualified (2016), Mechanical Engineering (Rank 83)

Marie Curie Scholarship for Doctorates

Languages

English, Malayalam - Fluent

French - Intermediate

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Profile

I hold a PhD in Computational Fluid Mechanics with a strong focus on developing innovative computational tools and open-source software for advanced fluid dynamics simulations. My expertise spans across fluid modeling, numerical methods, and high-performance computing. I am passionate about research that drives technological advancements in the field, with a particular interest in optimizing and refining computational algorithms.

Experience

Doctor Of Philosophy (PhD)

"Numerical Simulations of Cavitation In Blood Vessels Using Parallel Front Tracking Method"

- Supervisor : Dr. Stephane Zaleski

Sorbonne University, Paris May 2019 - December 2023

- Research addresses targeted drug delivery using acoustic cavitation of microbubbles, modeled via immersed boundary + front tracking methods for compressible multiphase flows and fluid-structure interactions.
- The approach is embedded in an adaptive mesh refinement (AMR) framework to capture complex, localized phenomena efficiently.
- Designing scalable partitioning strategies for Eulerian (AMR) and Lagrangian (surface mesh) data structures, ensuring efficient parallel communication.
- A new Lagrangian mesh partitioning scheme, integrated with a front-tracking, VoF-based All-Mach solver handling compressibility and surface tension.

Research Project

"Optimization of Surface Mesh Partition for Interfacial Flows"

- Supervisor : Dr. Stephane Zaleski

Sorbonne University, Paris Jan 2024 - July 2024

- Optimisation of mesh partition strategies and communication strategies in interfacial flow simulations involving both surface and volume meshes

Education

MTech, Mechanical Engineering

"Simulation of Interfacial Flows using Block-based AMR Meshes"

- Supervisor : Dr. Gourav Tomar

IISc, Bengaluru 2016-2018 9.1 CGPA

Contact Reference

- Dr. Stephane Zaleski, Professor, Sorbonne University, Paris stephane.zaleski@sorbonne-universite.fr
- Dr. Stephane Popinet, Professor, Sorbonne University, Paris popinet@basilisk.fr
- Dr Gaurav Tomar, Professor, Department of Mechanical Engineering, IISc Bengaluru, gtom@iisc.ac.in

<https://github.com/basilkotilingal>