Ahmed Basil KOTTILINGAL

📍 Paris, France

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🧠 Technical Skills

- Computer Languages:
  - C | C++ | Python
  - Java Script
- High Performance Computing
  - HPC Programming C/C++
  - Cuda | OpenMP | MPI
  - Performance Analysis
  - Super Computer Scheduling
- 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

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 startegies 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

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