Lakshman**Anumolu**

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SUMMARY

Develop and implement numerical methods to perform accurate two-phase flow simulations in the context of engines, cooling equipments, atomizers, etc. Conduct fluid flow analysis and optimize the models to obtain efficient algorithms.

EXPERIENCE

Senior Research Engineer 2019-Present
Convergent Science, Madison, WI

- Implemented surface reconstruction algorithms to generate post processing data for photo-realistic rendering
- Optimized Eulerian-Lagrangian modeling to efficiently simulate two phase flows while preserving conservation laws
- Optimized the Lagrangian advection algorithms by replacing linked list with structure of arrays paradigm

Research Engineer 2017-2019
Convergent Science, Madison, WI

- Designed and implemented efficient data structures to perform spray simulations by taking advantage of contiguous memory allocation
- Implemented post-processing utilities to efficiently and correctly compute liquid penetration andmean diameter for a diesel injection process
- Implemented numerical algorithms for efficient handling of spray motion
- Implemented volume of fluid based algorithms to simulate phase change of fluids due to heat transfer
- Performed a detailed numerical study on the existing two-phase capturing algorithms to identify the optimum range of control parameters for various fluid configurations and boundary conditions

Research Assistant 2011-2015
University of Wisconsin-Madison, Madison, WI

- Implemented phase-change capabilities into in-house developed solver to perform two-phase boiling simulations.
- Developed fourth order accurate semi-Lagrangian method tosolve Hamilton-Jacobi equations that can improve the quality of two-phase fluid simulations in thecontext of level set methods
- Developed and maintained a fully parallelized two-phase flow solver in C++ [12K LOC] with theaid of gradient augmented level set and reinitialization algorithms and Ghost Fluid Method.
- Performed a detailed numerical study on interFoam, a two-phase flow solver shipped with Open-FOAM C++ libraries.
- Developed post-processing utilities in C++ to achieve photo-realistic rendering for density fieldsfrom OpenFOAM results using Mitsuba.

PUBLICATIONS

Gradient augmented level set method for phase change simulations, Lakshman Anumolu, Mario F. Trujillo, Journal of Computational Physics, 353(1):377-406, 2018.

Direct Numerical Simulations for Two-Phase Flows with Phase Change, Mario F. Trujillo, Lakshman Anumolu, Douglas Ryddner, volume 3 of *Encyclopedia of Two-Phase Heat Transfer and Flow*. World Scientific, 2018.

The distortion of the level set gradient under advection, Mario F. Trujillo, Lakshman Anumolu, Douglas Ryddner, Journal of Computational Physics, 334:81-101, 2017.

Numerical Simulation of Droplet Train and Free Surface Jet Impingement, Steven R. Lewis, Lakshman Anumolu, Mario F. Trujillo, International Journal of Heat and Fluid Flow, 44:610-623, 2013.

Gradient Augmented Reinitialization Scheme for the Level Set Method, Lakshman Anumolu, Mario F. Trujillo, International Journal of Numerical Methods in Fluids, 73(12):1011-1041, 2013.

Evaluating the performance of the two-phase flow solver interFoam, Suraj S. Deshpande, Lakshman Anumolu, Mario F. Trujillo, Computational Science & Discovery, 5:014016:1-36, 2012.

Local, Higher Order Accurate, Level Set Redistancing Methods, Lakshman Anumolu, Masters thesis, Madison WI, 2011.

EDUCATION

B.Tech Mechanical Engineering
National Institute of Technology Durgapur,

Ph.D. Mechanical Engineering, Computer Science (minor)
University of Wisconsin-Madison,

RECENT PROJECTS

Templates to render CFD results photorealistically
Lakshman Anumolu (Advised by Self) 2020

- Scene templates to kick-start scalable rendering of CFD results photorealistically
- Cross platform containerized tool kit is provided

SKILLS

Programming Languages: C++, Go, Python
Tools: cmake, gdb, valgrind, git
Environments: Linux, MacOS, Windows

ACTIVITIES

- Handling editor for SAE (Society of Automotive Engineers) International. (2019-Present)
- Reviewer for Aerospace Science and Technology. (2019-Present)
- Reviewer for Journal of Computational Physics. (2018-Present)