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

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

B.Tech Mechanical Engineering
National Institute of Technology Durgapur,

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)