China Rama Lakshman Anumolu

Status: H1B
https://lakshmananumolu.com
anumolu@uwalumni.com
(206)486-2546

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.

Education:

University of Wisconsin-Madison, Madison WI *May 2017*
Ph.D. Mechanical Engineering, Computer Science (minor)

Experience:

Senior Research Engineer, *May 2019 - Present*
Convergent Science Inc., 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, *March 2017 - May 2019*
Convergent Science Inc., 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 and mean 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/PhD Candidate, *June 2009 - May 2017*
University of Wisconsin-Madison, Madison, WI.

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

Graduate Assistant, *January 2015 - December 2015*
University of Wisconsin-Madison, Madison, WI.

- Assisting course instructors by evaluating exams and conducting class work for the courses, Introduction to Fluid Dynamics, Computational Fluid Dynamics, Introduction to Thermodynamics, and Internal Combustion Engines.

Publications And Reports:

Anumolu, L. and Trujillo, M. F. **Gradient augmented level set method for phase change simulations**. *Journal of Computational Physics 353, 377-406* (2018).

Trujillo, M. F., **Anumolu, L.**, and Ryddner D. T. **Encyclopedia of two-phase heat transfer and flow III**. *World Scientific ,265-287* (2018).

Trujillo, M. F., **Anumolu, L.**, and Ryddner D. T. **The Distortion of the Level Set Gradient Under Advection**. *Journal of Computational Physics 334, 81-101* (2017).

Lewis, S. R., **Anumolu, L.**, and Trujillo, M. F., **Numerical Simulation of Droplet Train and Free Surface Jet Impingement**. *International Journal of Heat and Fluid Flow 44, 610-623* (2013).

Anumolu, L. and Trujillo, M. F., **Gradient augmented reinitialization scheme for the level set method**. *International Journal of Numerical Methods in Fluids 73, 1011-1041* (2013).

Deshpande, S. S., **Anumolu, L.**, and Trujillo, M. F., **Evaluating the performance of the two-phase flow solver interFoam**. *Computational Science & Discovery 5, 014016:1-36* (2012).

Conference Proceedings:

Anumolu, L., Mashayekh, A., Srivastava, P., Pomraning, E., Coil, M., Quan, S., Dai, M., Wijeyakulasuriya, S., and Senecal, K., **High-fidelity numerical simulation of a pressure swirl atomizer.**. 14^{th} *Triennial International Conference on Liquid Atomization and Spray Systems, Chicago, IL* (2018).

Anumolu, L. and Trujillo, M. F., **Gradient Augmented Level Set Method for Two Phase Flow Simulations with Phase Change.**. *ILASS Americas, Dearborn, MI* 69^{th} *Annual Meeting of the APS Division of Fluid Dynamics, Portland, OR* (2016).

Anumolu, L., Aanjaneya M., Eftychios S., and Trujillo, M. F., **Simulating Phase-Change Phenomena Using Gradient Augmented Level Set Approach**. *ILASS Americas, Dearborn, MI* (2016).

Anumolu, L., Ryddner D. and Trujillo, M. F., **Simulations of Two-Phase Flows Using Gradient Augmented Level Set Method** 9^{th} *International Conference on Boiling and Condensation Heat Transfer, Boulder, CO* (2015).

Anumolu, L., Ryddner D. and Trujillo, M. F., **Comparisons and Limitations of Gradient Augmented Level Set and Algebraic Volume of Fluid Methods** 67^{th} *Annual Meeting of the APS Division of Fluid Dynamics, San Francisco, CA* (2014).

Anumolu, L. and Trujillo, M. F., **A Gradient Augmented Level Set Method Reinitialization Scheme** *ASME* 4^{th} *Joint US-European Fluids Engineering division Summer meeting and* 12^{th} *international conference on nanochannels, microchannels, and minichannels, Chicago, IL* (2014).

Anumolu, L. and Trujillo, M. F., **Gradient Augmented Level Set Reinitialization Approach** 65^{th} *Annual Meeting of the APS Division of Fluid Dynamics, San Diego, CA* (2012).

Anumolu, L. and Trujillo, M. F., **A Hybrid Re-initialization Scheme for the Augmented Level Set Method** *ILASS-Americas, San Antonio, TX* (2012).

Anumolu, L. and Trujillo, M. F., **Redistancing the Augmented-Level Set Method** *ILASS-Americas, Ventura, CA* (2011).

Awards & 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).
- Reviewer for ASME (Americal Society of Mechanical Engineers) (2013 - present).
- Reviewer for SAE conferences (2011 - present).