XUXIAO LI

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EDUCATION

Tongji University — Shanghai, China
B.S./Aircraft Manufacturing Engineering — Jun. 2015

University of Utah — Salt Lake City, Utah
M.S./Mechanical Engineering — May 2019
Ph.D./Mechanical Engineering, Advisor: Prof. Wenda Tan — Expected Dec. 2020

PUBLICATION

Journal Articles

- **Li, X.**, Tan, W., 2018. Numerical investigation of effects of nucleation mechanisms on grain structure in metal additive manufacturing. Computational Material Science, 153, pp. 159-169.
- Herriott, C.F., **Li, X.**, Kouraytem, N., Tari, V., Tan, W., Anglin, B.S., Rollett, A.D., Spear, A.D., 2018. A multi-scale, multi-physics modeling framework to predict spatial variation of properties in additive-manufactured metals. Modelling and Simulation in Materials Science and Engineering, 27, p. 025009.
- Kouraytem, N., **Li, X.**, Cunningham, R., Zhao, C., Parab, N., Sun, T., Rollett, A.D., Spear, A.D., Tan, W., 2019. Effect of laser-matter interaction on molten pool flow and keyhole dynamics. Physical Review Applied, 11(6), p.064054.
- Zhao, C., Guo, Q., **Li, X.**, Parab, N., Fezzaa, K., Tan, W., Chen, L., Sun, T., 2019. Bulk-explosion-induced metal spattering during laser processing. Physical Review X, 9(2), p.021052.
- **Li, X.**, Zhao, C., Sun, T., Tan, W., 2020. Revealing transient powder-gas interaction in laser powder bed fusion process through multi-physics modeling and high-speed synchrotron X-ray imaging. Additive Manufacturing, under review.
- **Li, X.**, Tan, W., 2020. Numerical modeling of powder-gas interaction in laser powder bed fusion process. Journal of Manufacturing Science and Engineering, under review.

Conference Papers

- **Li, X.**, Tan, W., 2016. Numerical investigation of laser absorption by metal powder bed in selective laser sintering processes. Solid Freeform Fabrication Symposium 2016, Austin, TX.
- **Li, X.**, Tan, W., 2017. 3-dimensional Cellular Automata simulation of grain structure in metal additive manufacturing processes. Solid Freeform Fabrication Symposium 2017, Austin, TX.
- Sun, D., **Li, X.**, Tan, W., 2017. A parametric study on grain structure in selective laser melting process for stainless steel 316L. Solid Freeform Fabrication Symposium 2017, Austin, TX.
- Tan, W., **Li, X.**, 2017. Numerical Modeling of Grain Growth in Laser Engineered Net Shaping (LENS) of AISI 316 Stainless Steel. Manufacturing Science and Engineering Conference 2017, Las Angeles, CA.
- **Li, X.**, Tan, W., 2020. Numerical Modeling of Powder Gas Interaction for Laser Powder Bed Fusion Process. Manufacturing Science and Engineering Conference 2020, Cincinnati, OH.

RESEARCH EXPERINCE

Computational Fluid Dynamics (CFD)

- *Solver*: Maintaining an in-house, density-based, finite-volume CFD solver which utilizes a pre-conditioning formulation to solve both incompressible and compressible flows in a unified manner.
- *Multi-phase Flow*: Developed and modularized an interface-capturing framework based on the Level-Set and Ghost Fluid Method. Integrated the interface-capturing module into the CFD solver. Conducted multi-phase flow simulations for laser welding processes.
- *Fluid-Solid Interaction*: Developed and modularized a Lagrangian particle-tracking framework based on the Discrete Element Method. Integrated the particle-tracking module into the CFD solver. Conducted simulations for the gas-powder interaction in metal additive manufacturing processes.

Computational Material Science

- Developed a Cellular Automata model and conducted simulations for the nucleation and grain growth in metal casting, welding and additive manufacturing processes.

COMPLETED COURSEWORK

Optics	Heat Transfer	Manufacturing Processes
Computational Fluid Dynamics	Thermodynamics	Kinetics
Turbulence	Radiation	Numerical Solutions of PDEs
Machine Learning		

TECHNICAL SKILLS

- *Programming Language*: Fortran, c/c++, Python, MATLAB
- *Commercial Software*: Comsol, Abaqus
- *High Performace Computing*: MPI, OpenMP, Linux, Slurm

TEACHING ASISTANTSHIPS

Manufacturing for Engineering Systems — Fall 2016, Spring 2017, Fall 2017