

XUXIAO LI
801-209-6239
xuxiao.li@utah.edu

EDUCATION

Tongji University

B.S./Aircraft Manufacturing Engineering, GPA: 4.5/5.0

Shanghai, China

June 2015

University of Utah

Ph.D./Mechanical Engineering, Advisor: Prof. Wenda Tan, GPA: 3.9/4.0

Salt Lake City, UT

5th Year

COMPLETED GRADUATE COURSEWORK

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|---|---|--|
| <input type="checkbox"/> Optics | <input type="checkbox"/> Heat Transfer | <input type="checkbox"/> Manufacturing Processes |
| <input type="checkbox"/> Computational Fluid Dynamics | <input type="checkbox"/> Thermodynamics | <input type="checkbox"/> Kinetics |
| <input type="checkbox"/> Turbulence | <input type="checkbox"/> Radiation | <input type="checkbox"/> Numerical Solutions of PDEs |
| <input type="checkbox"/> Machine Learning | | |

TEACHING ASSISTANTSHIPS

Manufacturing for Engineering Systems

Fall 2016, Spring 2017, Fall 2017

PUBLICATIONS

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.
- **Li, X.**, Zhao, C., Tan, W., Sun, T., 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* (submitted).
- **Li, X.**, Tan, W., 2020. Numerical modeling of powder-gas interaction in laser powder bed fusion process. *Journal of Manufacturing Science and Engineering* (submitted).
- 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*.
- 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.

Conference Papers

- **Li, X.**, Tan, W., 2016. Numerical investigation of laser absorption by metal powder bed in selective laser sintering processes. *Solid Freeform Fabrication*.
- **Li, X.**, Tan, W., 2017. 3-Dimensional cellular automata simulation of grain structure in metal additive manufacturing processes. *Solid Freeform Fabrication 2017*, pp. 1030-1047.
- **Li, X.**, Tan, W., 2020. Numerical modeling of powder-gas interaction in laser powder bed fusion process. *15th International Manufacturing Science and Engineering Conference* (submitted).
- 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 2017*, pp. 7-9.
- Tan, W., **Li, X.**, 2017. Numerical modeling of grain growth in laser engineering net shaping (LENS) of AISI 316 stainless steel. *12th International Manufacturing Science and Engineering Conference*.

RESEARCH EXPERIENCE

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.

TECHNICAL SKILLS

- Programming: Fortran, c/c++, c#, MATLAB, Python.
- Software: COMSOL, ABAQUS.
- High Performance Computing: MPI, OpenMP, Linux, SLURM scripting.