

Position: Engineer or Senior Engineer, Modeling and Simulation

Department: Digital Engineering

Reporting To: Senior Engineering Manager – Modeling & Simulation

Job Location:

**LIFT ALMMII Headquarters
1400 Rosa Parks Blvd
Detroit, MI 48216**

Scope of Work & Purpose:

LIFT is seeking a subject matter expert that will lead state-of-the art materials development and evaluation through modeling and simulation, delivering innovative materials and manufacturing solutions for our customers and collaboratively within our ecosystem. This individual will drive innovations in material simulation, for domains including but not limited to:

RESPONSIBILITIES

- Crystal Plasticity Simulations: Conduct numerical simulations to model crystallographic slip associated with deformation
- Model Development: Develop and validate crystal plasticity models to connect micro-, meso-, and macro-mechanical properties.
- Analysis: Analyze simulation results to gain insights into the behavior of crystallographic systems and propose design improvements with particular emphasis on mechanical behavior of metallics including aluminum alloys, steels, titanium alloys, nickel-based alloys, and refractory metals
- Optimization: Collaborate with stakeholders to optimize design.
- Documentation: Prepare clear and concise reports, documentation, and presentations to communicate findings and recommendations to stakeholders.
- Continuous Learning: Stay up to date on industry trends, emerging technologies, and best practices in crystal plasticity and simulation mechanics
- Develop application-focused performance simulations to support programmatic work within time and budget constraints, internal to LIFT and collaboratively with Ecosystem member organizations.
- Support program development efforts, including preparation of white papers and proposals.

PREFERRED QUALIFICATIONS

- A degree in Materials, Metallurgical, Aerospace, or Mechanical Engineering, or related field with 3-5 years' experience. PhD preferred.
- Solid understanding of mechanics of materials, and the effect of thermo-mechanical processing on microstructure, properties, and subsequent performance
- Experience with multi-scale modeling of metallic material and structures.
- Experience with meso-scale physics-based modeling such as crystal/polycrystal plasticity, elasto-viscoplastic formulation based on Fast Fourier Transforms (EVPFFT), or other methods to connect micro- and macro-mechanical properties.



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- Experience with any of the following FE solvers: Abaqus, LS-Dyna, Nastran.
- Experience in Material Science codes such as VASP, DAMASK, Thermo-Calc, Micress.
- Experience modeling applications involving aluminum alloys, steels, titanium alloys, nickel-based alloys, and refractory metals, monolithic ceramics, or ceramic matrix composites
- Familiarity with the approaches of density functional theory and molecular dynamics
- Programming expertise a plus (C++, Fortran, Python, Dbase, etc.).
- Successful track record to ideating, planning, and executing technical work in an R&D or manufacturing environment preferred.
- Ability to operate within a project-based technology development environment.
- Ability to work with multi-disciplinary teams and multiple simultaneous projects.
- Ability to operate within and successfully interface with many stakeholders including LIFT member Ecosystem and end customers.
- Good oral and written communication skills.
- Ability to function effectively within a project team.

BEHAVIORAL COMPETENCIES

Customer Focus, Learning on the Fly, Intellectual Horsepower, Action Oriented, Ethics and Values, Integrity and Trust, Functional/Technical Skills, Forward Thinking.

About LIFT:

LIFT, operated by the American Lightweight Materials Manufacturing Innovation Institute (ALMMII), is a nonprofit, public-private partnership, national advanced manufacturing innovation institute. As the national advanced materials manufacturing innovation institute, LIFT is an accelerator convening and connecting government, industry and academia in the fields of advanced materials, manufacturing processes, systems engineering and talent development to enhance America's manufacturing competitiveness, national economy and national security.