Post-doctoral position in Applied Mechanics

Northeastern University

Boston, MA

A post-doctoral position in the general area of applied mechanics is available in the Mechanical Engineering Department at Northeastern University.

The general goal of this work is to investigate the mechanics of the material build-process in cold spray 3D additive manufacturing. The work will aim to create building blocks that can realistically simulate: i) deposition shape and history; ii) heating effects due to hot-gas impingement and plasticity; and, iii) residual stress history and porosity. In order to develop these building blocks combined experimental, analytical and computational approaches will be used. The building blocks will then be combined into a homogenized model to simulate the cold spray (CS) coating process. Coating of planar shapes such as rectangles, circles, etc. will be simulated. The analysis capability delivered with this approach will be used to predict the residual stresses and temperature history in the coatings.

Knowledge of finite element theory, contact mechanics, plasticity and cohesive zone using customized codes and LSDyna (and Abaqus) are required. Experience with writing own finite element codes, user subroutines (with FORTRAN) and Python code will be helpful for the position. The position is available for 1 year with possible extension for another. The post-doctoral fellow will interact with a network of PIs, post-docs and graduate students working in continuum mechanics, molecular dynamics, metallurgy and experiments. The work will involve both experimental and theoretical components. Interested candidates are encouraged to contact Professor Sinan Muftu (s.muftu@northeastern.edu) with a letter describing their relevant experience, and send their CV with the names of three references.

US Citizenship or permanent residency is required.