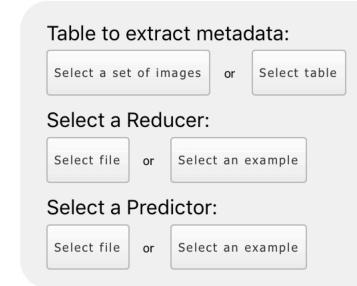# Composite Strength

UCSB Materials Data Science

Version: 1 Authors: Amil Khan, Marat I. Latypov

Predicts effective strength of 3-D RVE of a 2-phase composite with strength contrast of 5.0

1. Select data for processing:

Table to extract metadata:

[Select a set of images] or [Select table]

Select a Reducer:

[Select file] or [Select an example]

Select a Predictor:

[Select file] or [Select an example]

2. Parameters:

Phase Path from HDF: `/DataContainers/SyntheticVolumeDataContainer/CellData/Phases`

3. Run algorithm:

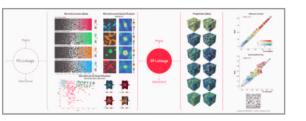[Run] This may take some time, progress will be shown here.

4. Results:

No results yet, please run the module first.

About:

This module implements a surrogate model that predicts effective yield strength of a composite given its 3-D microstructure.

The model is developed for composites with strength contrast of 5: strength of hard phase s2/s1 = 5. The model works best on periodic 3-D microstructures.

Calibration of the model is done by finite element simulation data by multivariate polynomial regression between principal component scores of 2-point statistics (representing microstructure) and effective yield strength (property). See more details in the paper, Data-driven reduced order models for effective yield strength and partitioning of strain in multiphase materials.

Input

HDF5 file containing spatial information of phases.

Output

Predicted effective yield strength.