A PHYSICS-GUIDED MACHINE LEARNING MODEL BASED ON PERIDYNAMICS

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With the rapid growth of available data and computing resources, using data-driven models is a potential approach in many scientific disciplines and engineering. However, for complex physical phenomena that have limited data, the data-driven models are lacking robustness and fail to provide good predictions. Theory-guided data science is the recent technology that can take advantage of both physics-driven and data-driven models. In this presentation, a new physics-guided machine learning model based on peridynamics will be presented [1,2]. Peridynamics is a suitable approach for predicting progressive damages because the theory uses integro-differential equations instead of partial differential equations. Several numerical examples will be shown to demonstrate the capability of the methodology.

REFERENCES

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