

ACCELERATING MATERIALS SIMULATIONS WITH ML: ROB PETER TO PAY PAUL?



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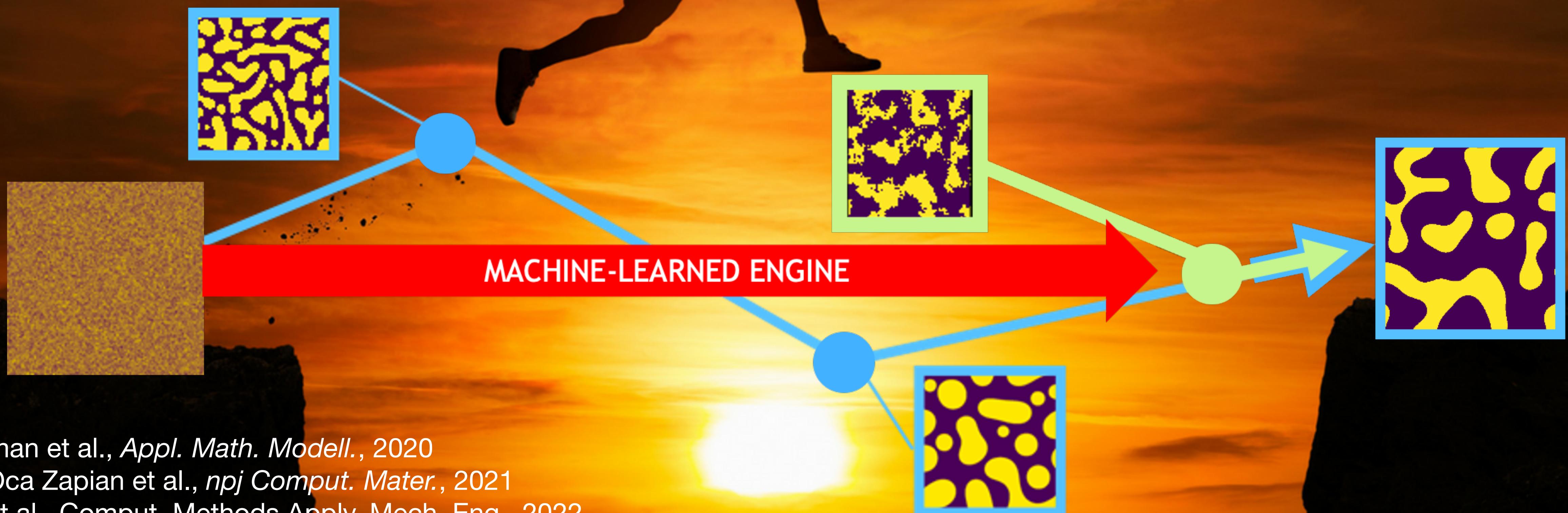


High-fidelity phase field trajectory



Accelerated trajectory

- POLYNOMIAL CHAOS EXPANSION
- RNNs
- DEEPONET



Herman et al., *Appl. Math. Modell.*, 2020

De Oca Zapian et al., *npj Comput. Mater.*, 2021

Hu et al., *Comput. Methods Appl. Mech. Eng.*, 2022

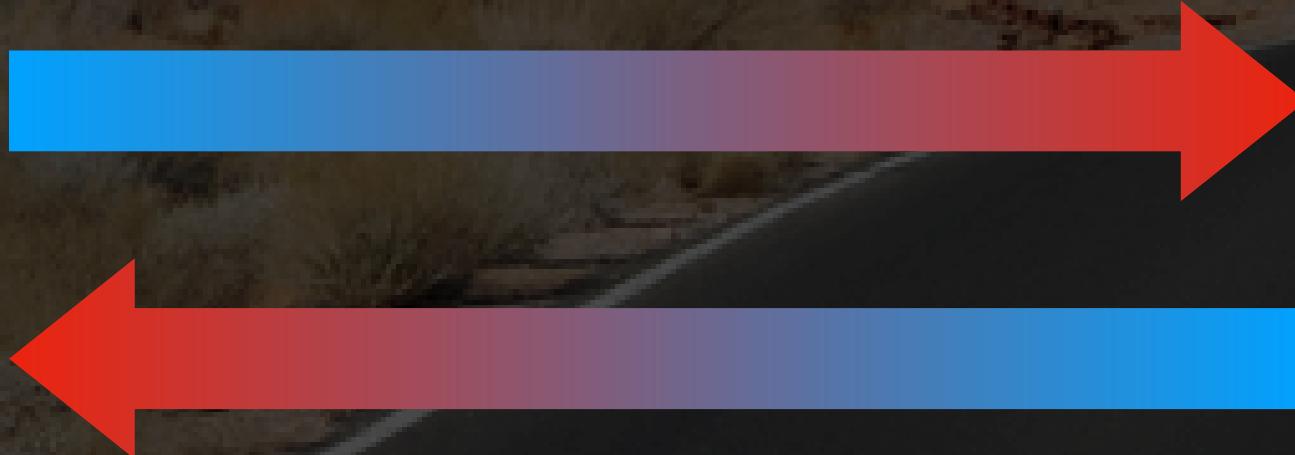
Oommen et al., *npj Comput. Mater.*, 2022

WE HAVE NOT SUCCEEDED YET!

SPEEDING UP THE LEARNING WORKFLOW



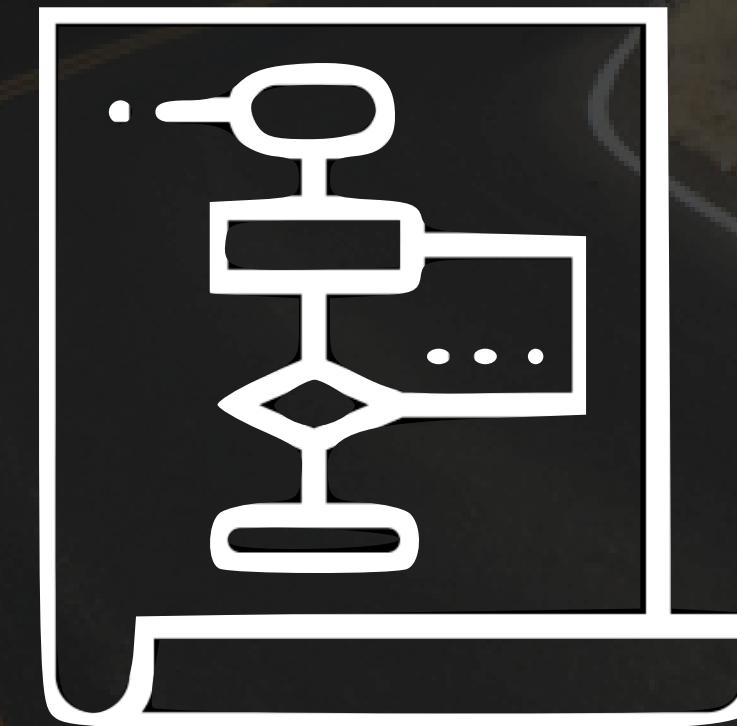
SMALL DATA



LOT OF PHYSICS

No PHYSICS

USEFUL (SPATIO-TEMPORAL) REPRESENTATIONS



TOWARDS REAL DATA FUSION

