

Coupling Computational Solid Mechanics and Deep Learning for Surrogate Modelling of Aortic Wall Mechanics

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We present a Deep Learning driven framework combining statistical shape analysis, computational solid mechanics, and neural networks to estimate patient-specific aortic wall stress and strain. The surrogate model accurately predicts spatial distributions of mechanical quantities considering patient-specific anatomies and wall properties. The model produces the estimations with a fraction of the computational cost of the high-fidelity numerical simulations, enabling rapid assessment of wall mechanics under physiological conditions.