- Developed a framework coupling Computational Solid Mechanics and Deep Learning to estimate aortic wall mechanics.
- Introduced a dataset generation pipeline integrating patient-specific geometries, material properties, and blood pressure.
- Trained neural networks to predict spatial distributions of the Second Piolla-Kirchoff stress and the Right Cauchy-Green strain considering patient-specific anatomies and wall properties.
- Demonstrated that the surrogate model achieves accurate, patient-specific predictions with a drastic reduction in computational time compared to full numerical simulations.
- Identified the instantaneous pressure as a dominant factor influencing model performance.