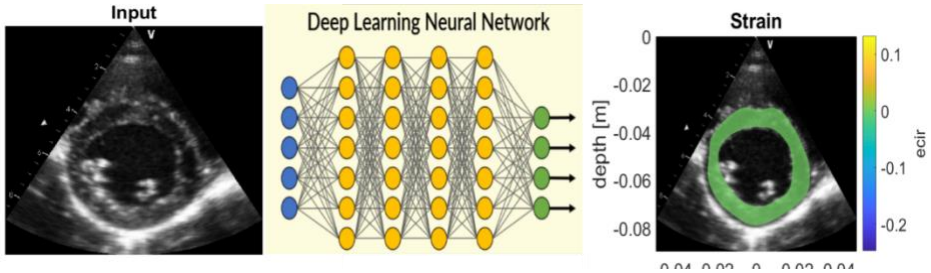
Deep Learning for Novel Ultrasound Functional Imaging (UFI)



Ultrasound Functional Imaging (UFI) includes methods for assessing cardiac function by measuring cardiac output and myocardial strain. The verification and reproducibility of these methods is an important area of concern and is a major issue in real-world applications. Simulations and phantoms (used in verification) are often unrealistic and not a true representation of the real data. This is due to the lack of crucial hemodynamic parameters and clinical variations between patients. Strain imaging provides estimates of radial, circumferential and longitudinal strain that can be used in the assessment of myocardial function. The process of obtaining strain consists of many steps going from the RF data to the strain image including segmentation by the expert. These operations are time consuming, require expert annotations and are computationally complex. Deep learning has wide applicability in computer vision as well as in other applications such as medical image reconstruction and processing. The idea of this project is to use deep learning-based techniques for the analysis of the various steps for reducing the time complexity. The focus will be on models which have less computational complexity and hence can be easily deployed on hardware for faster processing.

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