

## Deep Learning in Ultrasound Imaging

In this study analysis deep learning strategies in ultrasound systems, from the front end to advanced applications. Our goal is to provide the reader with a broad understanding of the possible impact of deep learning methodologies on many aspects of ultrasound imaging. In particular, we discuss methods that lie at the interface of signal acquisition and machine learning, exploiting both data structure (e.g., sparsity in some domain) and data dimensional (big data) already at the raw radio-frequency channel stage. As some examples, we outline efficient and effective deep learning solutions for adaptive beam forming and adaptive spectral Doppler through artificial agents, learn compressive encoding for the color Doppler, and provide a framework for structured signal recovery by learning fast approximations of iterative minimization problems, with applications to clutter suppression and super-resolution ultrasound. These emerging technologies may have a considerable impact on ultrasound imaging, showing promise across key components in the receive processing chain.

**Domain:** Python / Deep Learning

**Technology:** Python