

Abstract

Components of an ultrasound scanner as parts of a linear system is presented. This is used as a launching point to a discussion of various methods of simulation of the image formation process including extensions to nonlinear propagation. Hardware implementations of scanners are discussed with particular attention at the way increasingly faster and smaller microelectronics have influenced a scanner, its form factor, and range of clinical applications. The most recent phase of this process involves the migration of remaining digital hardware processing into software implementations. This short course will finish with a discussion of several software beamformation approaches that have been implemented already. A review of new approaches that have become available with the processing of channel data (i.e. pre-beamformed data) and possible new diagnostic methods will be discussed. Of interest in this context is the potential role of new initiatives, largely in academia, to further develop modern beamformers such as the PICMUS challenge at IUS2016.