Automated ultrasound assessment of amniotic fluid volume using machine learning

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Abstract. Ultrasound assessment of amniotic fluid volume (AFV) is routinely performed during pregnancy, because AFV is an important indicator of fetal’s well-being as well as perinatal prognosis. However, AFV measurement is cumbersome, patient-specific, and sonographer-dependent, and its accuracy varies greatly depending on the level of practice. Therefore, the development of accurate and reliable AFV evaluation methods is urgently needed, and its automation is expected to reduce user variability and improve workflow. However, the automation of AFV measurement is a very challenging task because AF region is often confused with various adversarial factors such as shadowing artifacts, reverberation artifacts, signal dropouts, and others. Moreover, AF region does not have a defined structural shape.

These difficulties are overcome in this paper by taking important surrounding characteristics such as uterine wall and fetal region into consideration and using characteristic clues that determine the boundary between AF and other tissues.

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