Enhancing Fetal Anomaly Scans with Artificial Intelligence: Advances, Applications, and Challenges

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Abstract

The fetal anomaly scan is a critical imaging evaluation during pregnancy, essential for detecting structural abnormalities. However, its accuracy is often compromised by factors such as high fetal mobility, maternal obesity, inter-observer variability, and protocol limitations. The integration of artificial intelligence (AI) into fetal ultrasound imaging holds the potential to mitigate these challenges by improving visualization, reducing examination time, and enhancing diagnostic precision. Artificial intelligence has been successfully applied to automate standard plane detection, biometric measurements, and, to a lesser extent, the identification of fetal malformations. To further advance the field, the PARADISE project has developed a comprehensive public dataset of 2D ultrasound scans capturing fetal morphology across various imaging planes, including organ segmentation (available at https://zenodo.org/records/14093338). This talk explores the current and emerging applications of AI in prenatal diagnosis, focusing on its role in optimizing ultrasound imaging and addressing key challenges in clinical implementation.

Keywords: Fetal Anomaly; Imaging Planes; Organ Segmentation; Artificial Intelligence (AI).