A Future where Assessing Placentas is Possible for All Births

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Abstract: A placenta is absolutely vital in a pregnancy and directs the health of both the mother and developing fetus. Standard pathology assessment of placentas, to glean important data for clinical decision making, takes too many resources and too much time to complete for all births. Low-resource settings suffer the most with the lowest access to expert pathology for placental assessment. We are designing a socially responsible artificial intelligence (AI)-based software tool – PlacentaVision – to assess and triage all placentas via digital photograph. Additionally, we plan to test performance metrics by race and ethnicity of the mothers. Our vision is a future where every birth, regardless of hospital setting and resources, will have the placenta assessed and in turn, better clinical care. Our interdisciplinary work will contribute to the Penn State strategic plan themes of enhancing health and empowering through digital innovation and impact socially responsible AI by contributing to social good and equity. The work will be led by faculty in Health and Human Development and Information Sciences and Technology. We will publish our results in top-tier data science/AI journals and submit an NIH R01 renewal application, with these results serving as preliminary data. This seed funding will allow us to move toward creating a socially responsible AI-based tool to assess all placentas, triage those needed to pathology, and ensure equity across racial and ethnic groups to meaningfully contribute to social good.