Problem owners

Luke Wainwright
Sue Hampton

Problem title

Improve diagnosis and reduce unnecessary interventions in newborn babies.

What is the problem you want to solve?

When assessing neonates, Midwives and Doctors too often mistake normal presentations as signs of disease. When this results in unnecessary procedures being performed it can cause distress to the baby / family, be unnecessarily risky and costly. Educational programs to address this issue are currently delivered using neonatal manikins that don't accurately reflect the clinical signs.

Why do you want to solve this problem?

The Royal Brisbane and Women's Hospital neonatal and midwifery team currently provides education for junior doctors, neonatal nurses and midwives for correct examination of babies and identification of normal and abnormal variations to presentation. Improving the educational program for these practitioners may reduce unnecessary tests and improve diagnosis of neonatal conditions.

What do you envision as the ideal solution for this problem?

Some clinical signs only appear on particular areas of the body, so focusing only on the face for example would not capture all the information that is needed. We would like to see an animated full body augmented reality overlay of the manikin with a number of presentations and skin types. The idea would be that the clinical expert would hold a tablet over the manikin and show the learners the presentation. They would then have a discussion on the correct way to manage the patient. This would improve the efficacy of the training and education program by providing a more immersive experience. Ideally the solution would be browser based so that it can be used across devices and without the need to download an app.

What sort of Open Source solution do you think can be created in 48 hours, by a small team of developers, designers and data analysts?

We have already created some prototypes for face only using Snapchat Lens Studio and the Unity app. We'd like to explore how to take this idea and move to a whole (manikin) body view. Over time we'd like the software to be able to simulate multiple presentations but to start out, we'd like to nail down a working full body overlay of a newborn baby. From there we would have a solid foundation to create different presentations for the future.

Are there datasets or people with domain knowledge that you will be bringing to work with? What/who are they?

Luke Wainwright is a Nurse Educator with 25 years' experience in clinical education and healthcare simulation. He led the first round of development of an augmented reality overlay for the face of a manikin using the Snapchat Lens Studio.

Sue Hampton is a Clinical Midwifery Consultant with 25 years' experience in midwifery education and healthcare simulation. She assisted in developing the current learning package used to train clinicians in neonatal assessment. She is also the lead evaluator on the augmented reality overlay project noted above.

We have the support of the Queensland Health Neonatal Network, the peak body for neonatal connections in the state. Many of their committee are part of the group of evaluators for the first version of this project that has just been completed.

We have professional full body images (front and back) taken a couple of weeks ago at the Royal Brisbane of a new baby that we have consent from the mother to use. We have secured the use of a state of the art $30,000 human patient simulator called SimNewB to use for the overlay. We also have the education package and an extensive collection of photos neonatal presentations to inform the group.

What are the current solutions for handling this problem?

A short instructor led course using manikins and videos.

Summary for website (up to ~ 1 page)

PROBLEM

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The Royal Brisbane and Women's Hospital Neonatal and Midwifery team currently provides education for junior doctors, neonatal nurses and midwives for correct examination of babies and identification of normal and abnormal variations to presentation. Improving the educational program for these practitioners may reduce unnecessary tests and improve diagnosis of neonatal conditions.

We would like to create an augmented reality animated full body overlay of a neonatal manikin with a suite of clinical conditions. The idea would be that the clinical expert would hold a tablet over the manikin and show the learners a variety of presentations. This would be followed by a discussion on the assessment, diagnosis and the correct management of the patient.
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