Doctoral Thesis Proposal: DEVELOPMENT OF A LOW-COST TOOL FOR THE ANALYSIS OF CRANIAL DEFORMATION IN INFANTS BASED ON PHOTOGRAMETRIC SOLUTIONS

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Abstract:

Cranial deformation is a very common problem attended by paediatric neurosurgeons. Despite of the high number of affected infants there are no standards for its measurement. Usually, the measurements are taken using a calliper. However, experts do not agree on the effectivity of this method as only a low number of measures can be taken. Other methodologies include 3D and TC scanners. These methodologies involve high costs and some of them, as the TC scanner, are highly invasive.

The aim of this project is the development of a novel, low-cost and low-invasive methodology for the analysis of the cranial deformation in infants based on 3D photogrammetric techniques. A smartphone will be used to record a video of the patient's head. Later the images will be processed to obtain a 3D model of the head. This model will allow the accurate and replicable evaluation and diagnosis of the deformation. To evaluate this deformation, the model will be compared with an ideal head shape matching the normal cranial parameters. The deformation will be obtained for each point of the model. The methodology will also allow the comparison between models taken in different dates, like pre-surgery and post-surgery.

The validation of the methodology will be carried out by comparing the results with measurements obtained using the TC scanner and the calliper.

Available Means:

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