TECHNOLOGY OFFER

Coded capelin for analysis of cranial deformation

INTELLECTUAL PROPERTY RIGHTS

The invention is protected by National Patent P201930355, dated April 17, 2019, in shared ownership between the IIS La Fe and the Polytechnic University of Valencia

CURRENT STATE OF DEVELOPMENT

The tool has a fully developed functional prototype.

MARKET APPLICATION SECTORS

Public-private hospital, specifically in the specialty of pediatrics

COLABORATION SOUGHT

Inventors are interested in licensing the patent to a company or potential start-up.

DESCRIPTION OF THE TECHNOLOGY

The present invention consists of a coded capeline that, used together with a mobile application, a web viewer and 3D processing software, allows the analysis of cranial deformation in infants in a non-invasive way. That is, it allows obtaining 3D models of children's heads, which allows the analysis of cranial deformation.

The capeline is made of an adjustable material on which a series of ArUco targets have been fixed, printed on a non-elastic material. For each frame the application detects the targets, the frame is selected and the targets detected and their coordinates are recorded in a file. No images are saved, so the required storage is very low. Data can be fully anonymized, increasing the security and privacy of highly sensitive data.Once the entire head has been registered with a minimum number of images, the 3D model can be obtained from the generated coordinate file. An algorithm encodes the numbering of the 3D point cloud, following the numbering of the encoded targets, through its own software and Tapas and AperiCloud tools, belonging to the MicMac software. Subsequently, the point cloud is scaled and the mesh is created using and the model is scaled.

The tool is intended to be used by medical personnel without knowledge of photogrammetry; Furthermore, the use of anesthesia is not necessary, since even in conscious lactating patients, it is not influenced by movement..

ADVANTAGES

- It allows obtaining 3D models non-invasively, quickly and at low cost.
- Simple and easy to use through the application.It works with movement.
- No anesthesia is necessary.
- Low cost solution, directly with the mobile and the app

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EXTRA INFORMATION

How to use.

The medical staff should place the capelin, two targets in the form of stickers will be added at the points identified as glabella and opistocranion. This will allow the models to be placed in a common coordinate system. Once the previous steps have been carried out, the device's camera will open and the interface will be similar to recording a video. In each frame those targets that are being detected will be displayed, in this way a non-expert user can easily check if the distance to the patient, focus, etc. are the right ones. The interface also shows the areas of the head that have already been properly registered and those that still require more images.

Figure 1. Design of the capeline

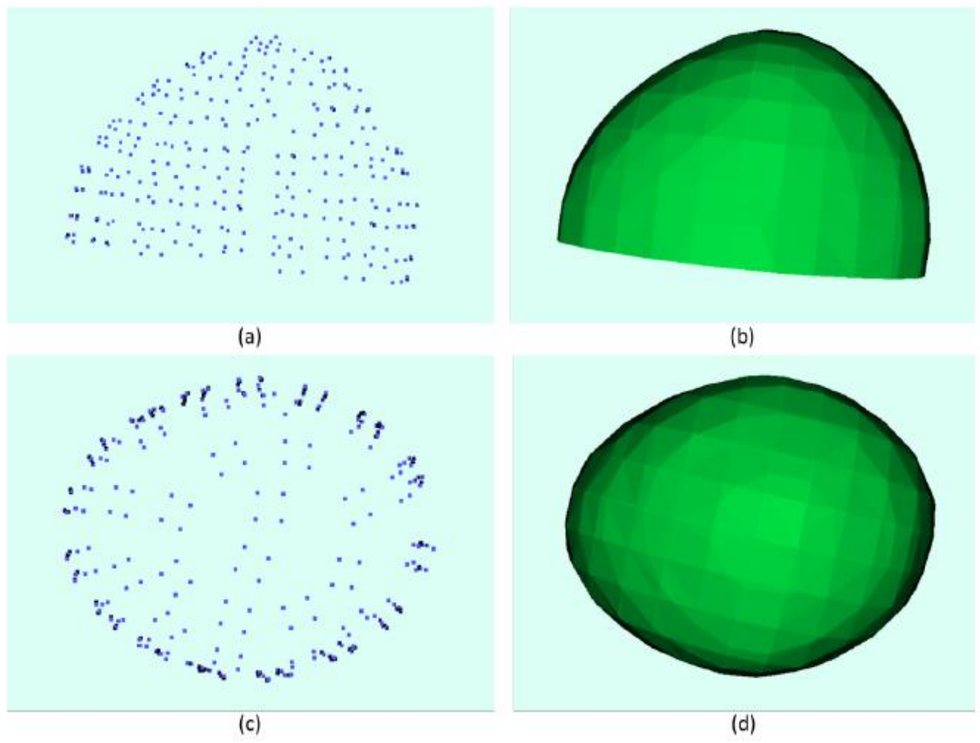

Figure 2. Side (a) and top views of the point cloud and the 3D model (b, d)

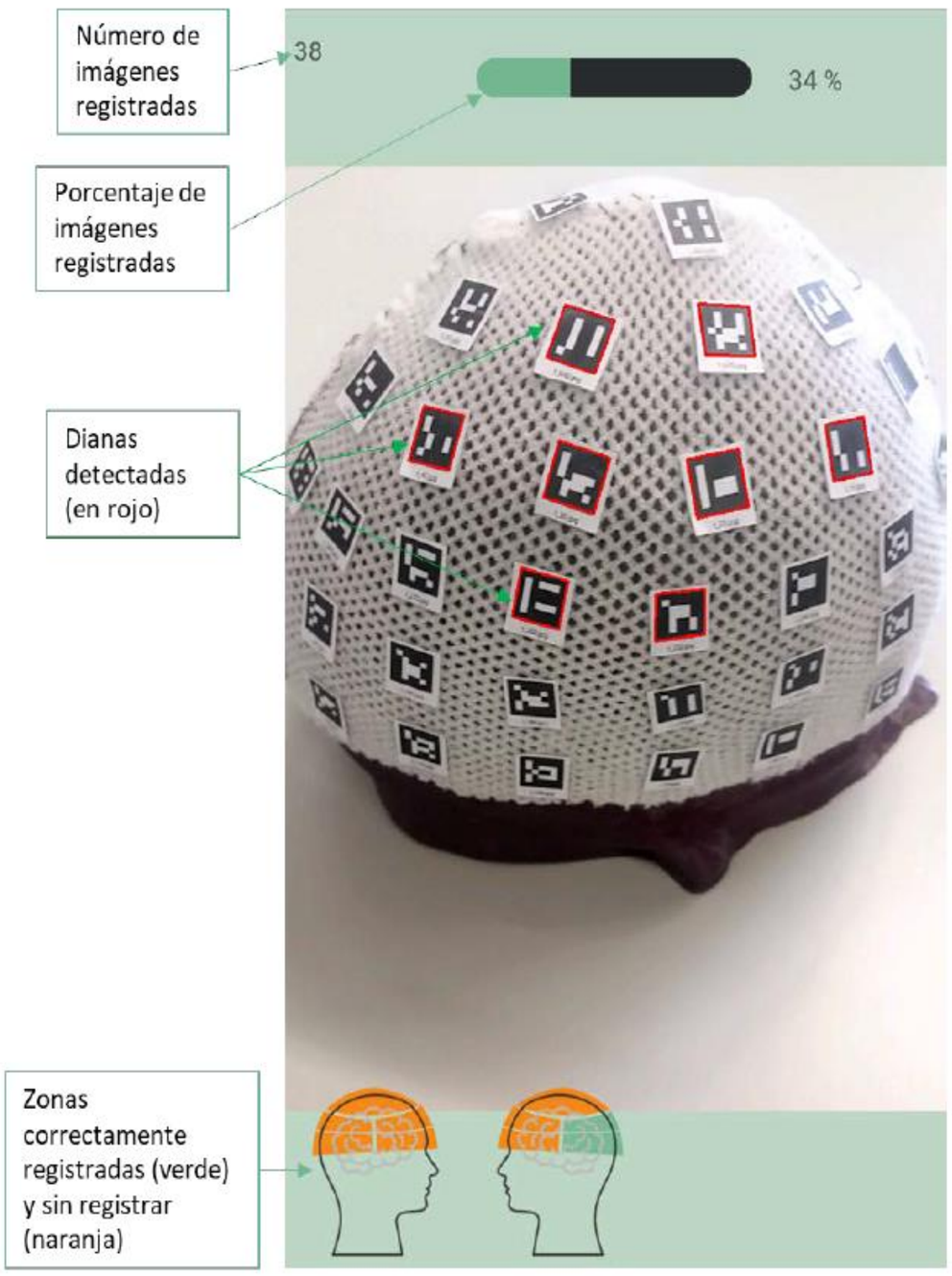

Figure 2. Side (a) and top views of the point cloud and the 3D model (b, d)

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