



## PHOTOMEDAS: Capeline or coded mesh for 3D cranial measurements

### DESCRIPTION OF THE TECHNOLOGY

Cranial deformation is a condition that affects a high percentage of infants. Its consequences range from purely aesthetic issues to the risk of high intracranial pressure in the most severe cases.

The assessment of the same is carried out by a medical team using methodologies such as the combination of measuring tape and calibre (fast and low cost results, while the information obtained is very limited), laser scanning integrated systems and cameras (very expensive, and rarely used in hospital), or radiological tests: CT and/or MRI (expensive plus they are highly invasive as they require the sedation of infants and involve radiation).

This invention consists of a capeline or coded mesh which, when used together with a mobile app, a web viewer and a 3D processing software, enables the analysis of cranial deformation, in infants or not, in a non-invasive manner.

The fitted capeline, which contains augmented reality targets, is placed on the patient's head. The medical personnel then add three targets,

which will facilitate the recording between different data points.

The mobile app guides the user (medical personnel) during the data collection process. The user needs to move the smartphone around the patient's head, just as he were recording a video. During this process the app detects the targets located in the capeline and obtains its coordinates in the images, even if the patient is moving uncontrollably.

Once the whole head is correctly registered, a file with photogrammetric data is automatically sent to a processing server where the 3D model is obtained.

The final results, including the 3D model of the head and the deformation parameters derived from the same, are made available to medical personnel through different means (web viewer, app). The medical personnel will have the possibility of assessing the parameters to obtain accurate diagnoses, consult and monitor the evolution of the patient from different models.



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### MARKET APPLICATION SECTORS

- The main use is the measurement of morphologies of the objects to which the capeline or mesh is adjusted, as is the case of infants' heads.
- The capeline or mesh can be used in hospitals, health centres and/or clinics, by for example pediatric and orthopedic sections/services, children's neurosurgery and sports medicine, as well as custom orthopedic companies and orthopedic workshops (for the manufacture of helmets or orthosis).
- The scope of use is much broader, since it allows the 3D reconstruction of any moving object: different parts of the body, or applications of mobile objects in medical, sporting and/or industrial environments.

### TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

- The capeline allows to obtain the data of the patient (infant or not) conscious awareness, not being affected by the patient's movement. Therefore, the use of anesthesia is not necessary.
- Pinpoint accuracy in the cranial measurement of infants.
- Images of the patients' faces (babies) are not taken, thus complying with data protection regulations.
- Data capture time in a few minutes.
- It does not require special lighting.
- The size of the files is small, both in the measurement process and in the 3D models.
- The solution is designed to work with image sensors controlled by an app, such as a smartphone or tablet.
- Low-cost and easy to use system. It does not require special skills.

### CURRENT STATE OF DEVELOPMENT

A laboratory prototype and measurement app are available.

### INTELLECTUAL PROPERTY RIGHTS

Patent Pending/  
Priority Number: P201930355  
Priority Date: 17/04/2019

### COLABORATION SOUGHT

The inventors seek a business partner to develop an industrial prototype with the option to license the patent.

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### PHOTOMEDAS: Capeline or coded mesh for 3D cranial measurements

Image 1:



Image 2:



### CONTACT

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