SOLAR COLLAR

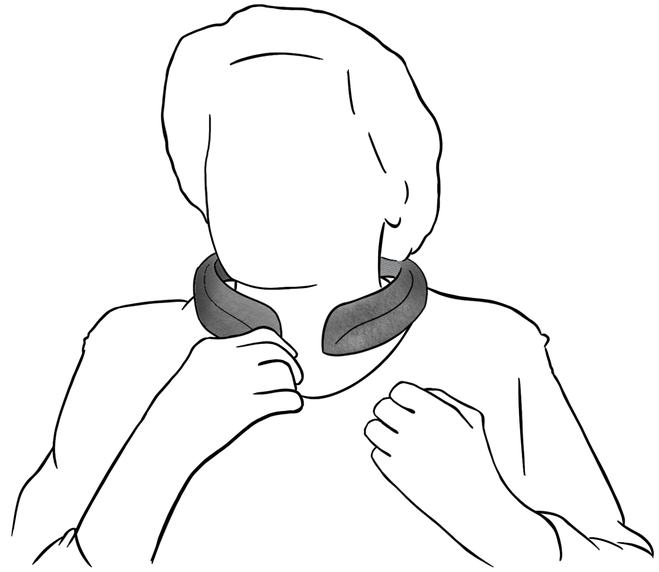
More products are being dependent on energy. The development of smart clothing also can be seen as one of the examples of this statement. The products we wear get new functionalities like measuring indicators of health like the heart rate, respiratory rate and fall detection.

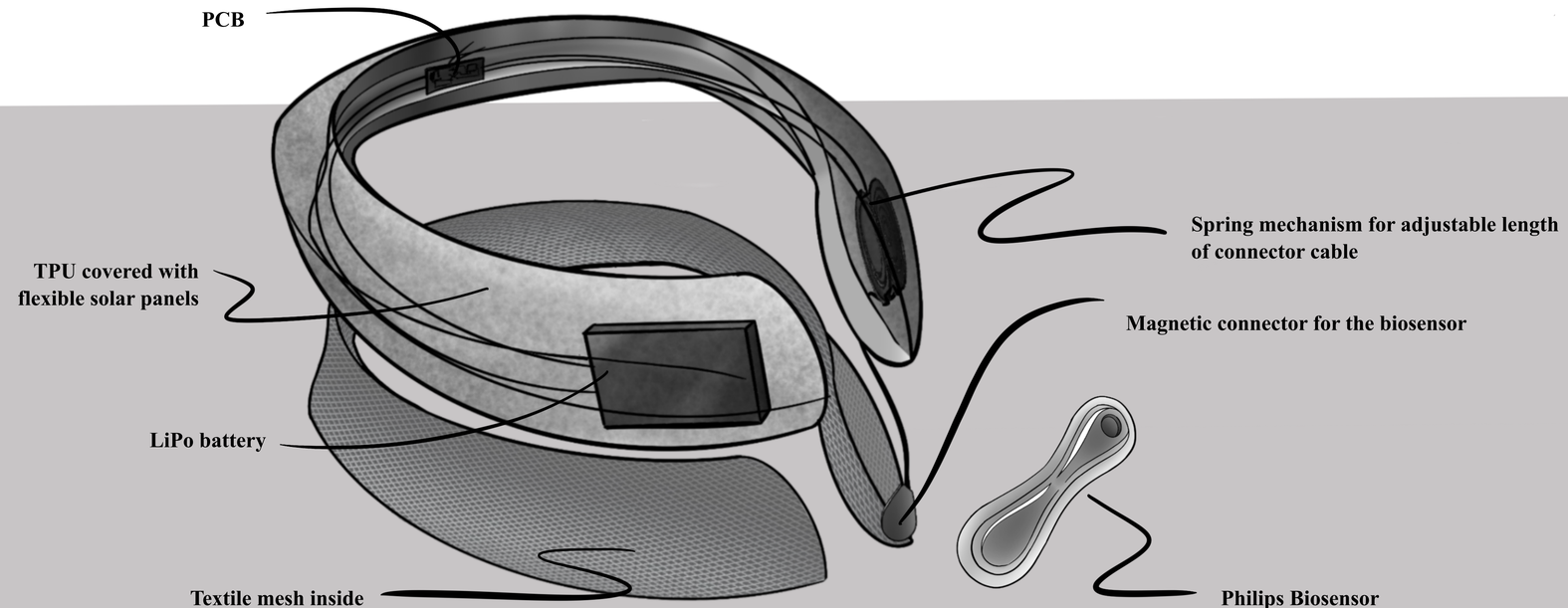
This thesis focussed on the possibility to generate energy in order to sustain these new functions of smart clothing and wearables. More precisely the focus laid upon the elderly of which these biomedical data is measured. Measuring this data and using it properly helps to act more efficiently in case of an emergency. The Philips biosensor is one of these biosensors which is taken as a reference point for the project.

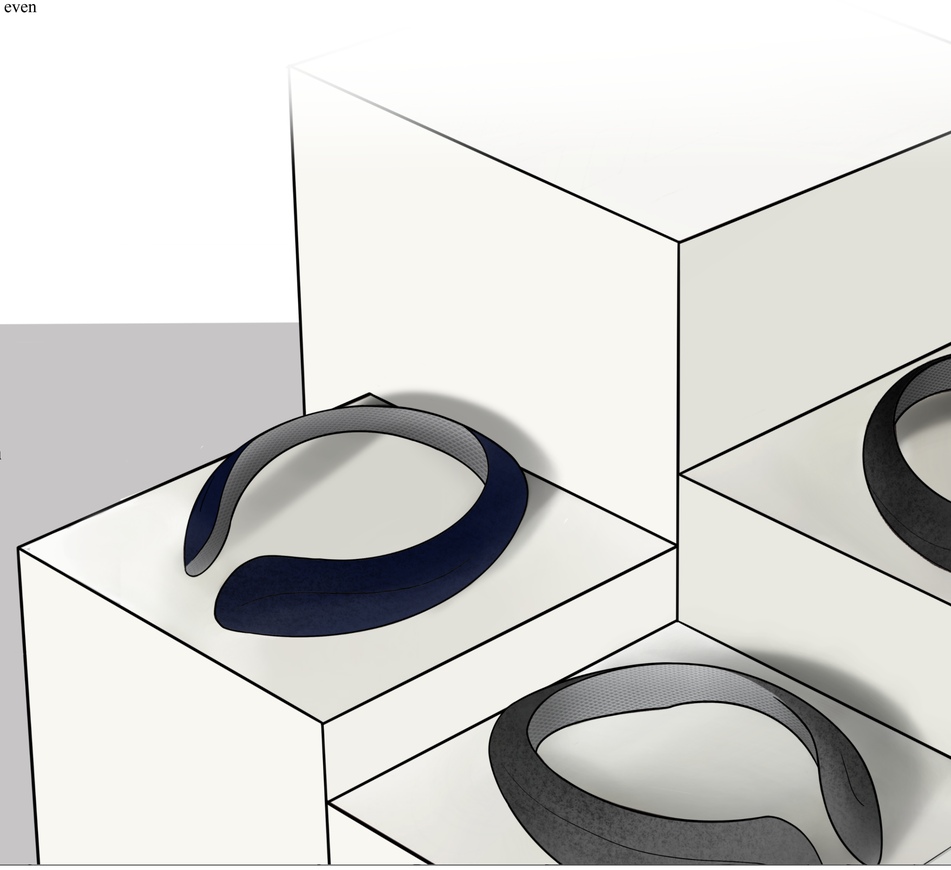
An analysis and evaluation have been done for diverse energy harvesting methods as these were required to fulfil the needs of the biosensor's energy demand. The final product that was designed was the Solar collar which can be worn whenever the user goes outside and is able to function in conditions without direct sunlight.

For the use of the collar, the user connects the magnetic connector to the biosensor that is placed on the chest. The collar's connection with the biosensor has been made to be easily detachable if wanted too, whilst keeping the connection secure enough to keep from disconnecting accidentally.

The Solar collar's inner material is thermoplastic polyurethane (TPU). This material moves with the user as it is flexible but still keeps its form. The inside of the collar is a textile mesh which offers a comfortable wear. Within the collar, the designed electrical circuit and other electrical components are placed evenly. The circuit has been designed in a way that directs the generated energy according to the demand of the biosensor and the internal LiPo battery. The LiPo battery acts as a buffer that can be used to charge the biosensor even without the sun.







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