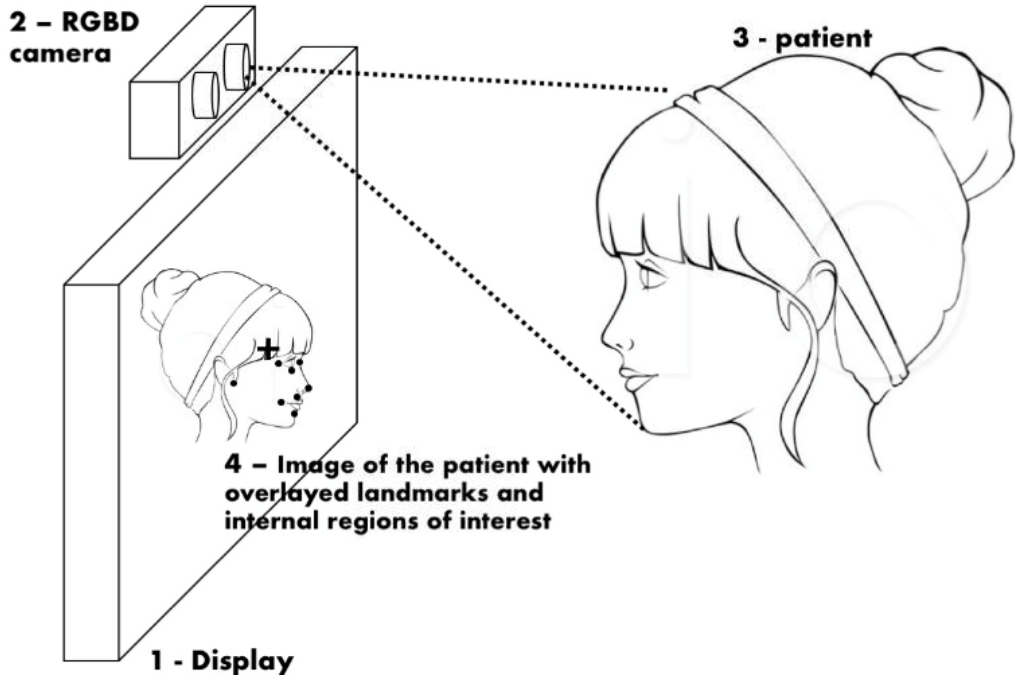
Docket #: S17-412

Neuro-navigation device for localization of internal anatomical regions

Stanford researchers in the McNab lab have developed a marker-less neuro-navigation device that only needs to be setup once during the first transcranial magnetic stimulation (TMS) session and by tracking the subjects head, automatically achieves the same accurate coil location and orientation during follow-up treatment sessions. TMS is a clinical treatment for depression where the same brain region needs to be localized 5 times a week over the course of 4-6 weeks. The recurring need to localize the same brain area make it the ideal application for this device. Such a device can track and save coil location and orientation without the need for prior MRI, collecting valuable data that can relate TMS coil targeting with treatment outcome. A dataset that contains head shape, coil placement and treatment outcome can then be used to develop much more effective TMS treatment protocols.



Stage of – Prototype
Using facial feature tracking the McNab lab head tracking technique successfully located the same scalp location during follow-up sessions within 2mm accuracy for 30cm camera distance and within 5mm for 60cm camera distance if the face is looking at the camera within an angle of less than 40degree.

Applications

- Neuro-navigation during TMS
- Other clinical applications that need localization of internal organs

Advantages

- Low cost
- Short setup time
- Precise and consistent
- More accurate than current “5cm rule” targeting method
- Needs only one calibration
- Markerless – links internal anatomical regions with externally visible landmarks such as eyes ,nose and head
- Easier to use compared to current marker-based clinical navigation devices
- Increased accuracy and treatment outcome compared to no navigation

Publications

- Leuze, C., & McNab, J. (2019). *U.S. Patent Application No. 16/269,407*.

Patents

- Published Application: 20190240499
- Issued: 11,291,852 (USA)

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