

Docket #: S22-520

Optimized, patient-specific targeting software for Focused-Ultrasound (FUS) thalamotomy

Stanford researchers have designed an automated targeting software that could be incorporated into planning for Focused-Ultrasound (FUS) thalamotomy such as MRI-guided-focused-ultrasound (MRgFUS) ablation) for tremor reduction.

Focused-Ultrasound (FUS) thalamotomy has proven effective at reducing tremors, however, traditional targeting methods can be suboptimal at balancing primary tremor-reduction outcomes against undesired side effects. As compared to the traditional targeting using canonical coordinates, this software is patient-specific and more precise to define the ideal ablation region of the ventralis intermediate nucleus (VIM) of the thalamus, for optimized tremor-reduction and Quality-of-Life (QoL) outcomes.

The described proprietary targeting algorithm can increase the efficacy of FUS thalamotomies as well as optimize VIM targeting for deep brain stimulation (DBS) implantation to reduce unwanted side effects and maximize positive outcomes. Additionally, this method is easily expandable into other brain targets for various functional neurosurgeries, including but not limited to FUS and DBS.

Stage of Development

- Pre-clinical studies
- Validation on retrospective data

Applications

- **Mapping for Surgical Brain Targeting (e.g. for treatment of Essential Tremor (ET))**
- **Software that can be incorporated into the planning for:**

- MRI-guided-focused-ultrasound (MRgFUS) ablation
- Deep Brain Stimulation (DBS)

Advantages

- Personalized, patient-specific targeting
- Higher Quality of Life (QoL) outcomes due to higher efficacy and less side effects
- Automated, less resource intensive

Publications

- Datta, AnDatta, Anjali; Loo Kung, Gustavo Chau; Barbosa, Daniel; Quah, Kristen; Purger, David Arnold MD; Ren, Alexander; Wang, Allan; Chodakiewitz, Yosefi; Tov, Lior Lev; Ghanouni, Pejman MD, PhD; McNab, Jennifer; Buch, Vivek MD. 501 [Patient-Specific Targeting Method for Improved Quality-of-Life Outcomes from MRgFUS Treatment of Essential Tremor](#). *Neurosurgery* 69(Supplement_1):p 110-111, April 2023.

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