Title: "Functional Ultrasound Brain-Machine Interface: offline proof-of-concept in non-human primates"

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Abstract: Brain-machine interfaces (BMIs) use neurophysiological signals from the brain to control external devices. Ideally, BMIs have high spatiotemporal resolution, are noninvasive, and portable. Most BMIs rely on neuroelectric methods that are either invasive (e.g. microelectrode arrays) or suffer from poor signal fidelity (e.g. EEG). BMIs based on metabolic activity are either cumbersome, (e.g. fMRI) or sacrifice imaging fidelity for portability (e.g. fNIRS). Recently, functional ultrasound (fUS) was introduced as a revolutionary hemodynamic imaging technique with excellent spatiotemporal resolution (100 mm,10 ms) [Mace et al, Nature Methods, 2011]. In addition, it is both noninvasive and portable: criteria where current techniques fall short. Thus, fUS is an ideal imaging technique for future BMIs.