Social, Life, and Engineering Sciences Imaging Center

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Abstract: The Social, Life, and Engineering Sciences Imaging Center (SLEIC) provides the Penn State research community with instrumentation, technological expertise, educational opportunities, and financial support for conducting non-invasive imaging research. Our team includes multiple Ph.D.-level faculty members with expertise in psychology, neuroimaging research design, biomedical engineering, and physics, who provide direct support to the Penn State community. SLEIC provides researchers with access to innovative, safe, non-invasive imaging technologies including Magnetic Resonance Imaging (structural, functional, perfusion, diffusion images), electrophysiology (Brainvision 32-channel and EGI 256-channel EEG systems), Functional Near Infrared Spectroscopy, trans-cranial Direct Current Stimulation, and eye-tracking. We serve over 30 principal investigators who conduct neuroimaging, materials research, and who come from nine departments across four colleges (HHD, CLA, Engineering, & Medicine).

SLEIC resources at Penn State allow users access to over 2500 hours of consulting, piloting, and data collection services per year. A research highlight from the many NIH-funded projects conducted at the facility is a comprehensive study of the mechanisms of speech and swallowing in individuals with Down syndrome, which is being carried out by faculty in Communication Sciences and Disorders. Individuals with Down syndrome have difficulty making their speech understood which has implications for individuals' ability to self-advocate and participate in social, vocational, and educational aspects of their lives. The goal of the study is to aid in the development of more tailored interventions for swallowing and speech problems in those with Down syndrome. A more materials related project is the development of dielectric resonators that will improve the signal to noise ratio (SNR) during clinical MRI examinations. This project is conducted by faculty from the Material Research Institute, the College of Medicine, and the Huck Institutes of the Life Sciences. Besides the gain in SNR, a reduction of temperature sensitivity of these resonators is the focus of this research.