Opportunity and Significance

Current imaging technologies lack the capability of early diagnosis of diseases such as Alzheimer's etc. In addition to this they are invasive, ionizing, label dependent with limited resolution and penetration depth. PA has the potential to provide solutions to problems such as imaging of action potentials in the brain, early indication of metastasis, detection of the hematologic spread of cancerous cells etc.

Technical Objectives

Build a wearable cap with embedded sensors that can monitor the hemodynamic changes and send it wireless to mobile/PC. Functional brain imaging is performed by real time monitoring of blood oxygenation and oxygen metabolism in resting and simulated states. We intend to make the system handy, portable and low cost by eliminating cables and going wireless.

Related Work and State of Practice

GE is currently working on building a high resolution imaging helmet based on PET (positron Emission tomography) by injecting radioactive biomarkers. To the best of our knowledge, our project is the first wireless, wearable PA technology.

Technical Approach, Accomplishments and Results

Resting State Functional Connectivity Analysis

Brain Imaging setup

Results acquired from our wireless device

Next Steps for Development and Test

We have so far determined the feasibility of employing wireless acquisition of PA signal from a single point. We will have to work on integration and multiplexing aspect of this design. We have to look into the cyber security issues as the data is sent wireless.

Commercialization Plan & Partners

We are looking forward collaboration and intend to commercialize this device. But for now we are doing some initial feasibility tests after which will partner with other organization in developing it.

References