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Brief research summary:

The research in my lab is focused on design and development of novel diagnostic and therapeutic **methodologies**, **algorithms,** and **instrumentations** for various types of biomedical applications such as diagnosis and treatment of cancer and other pathologies at their early stages of development. In other words, our overall mission is to design, develop, test, re-design, and validate devices, methods and algorithms for diagnostic imaging and therapeutic applications. The projects in our laboratory are ranging from molecular imaging to functional imaging and tissue differentiation, from drug delivery and release to image-guided surgery and intervention.

More specifically, our research is focused on design, development and validation of novel ultrasound-based imaging modalities capable of providing functional and molecular information through utilization of nanotechnology and nano-zied cellular and molecular labels. Photoacoustic (PA) imaging and Magneto-motive Ultrasound (MMUS) imaging systems will be initially developed, modified, and will be used. However, we will continuously design and develop novel, integrated hybrid diagnostic and therapeutic (so called theranostic) systems. Such systems are capable of performing diagnostic, highly localized therapy (such as photothermal therapy or RF ablation), and to monitor the therapy procedures (monitoring temperature, tissue stiffness, etc). By utilizing our knowledge, the equipment and facilities in our laboratory and within the college of Engineering and through a collaboration with school of medicine at Wayne State University, our goal is to form a multidisciplinary research laboratory to address important problems within the areas of non-invasive imaging and therapy techniques and instrumentation.

Our research is initially focused on development and validation of novel imaging modalities for pre-clinical applications with the ultimate goal of developing clinical systems to enhance the healthcare system.

You can refer to my publications for further information about my research http://goo.gl/gIj3IP or email me at mehr@wayne.edu with questions.

Open positions:

We are building a team of exceptional scientists and engineers who are interested in pursuing fundamentally innovative ideas in a multidisciplinary research environment. Highly talented and motivated students (PhD students) are welcome to get in touch. The applicants must have the following requirements:

1- Undergraduate/Masters degree in Electrical Engineering, Biomedical Engineering Computer Engineering, and Physics are preferred.
2- Strong familiarity with electronic/biomedical instrumentation (design, build and test), Signal and Image processing.
3- Experienced in MATLAB. Experience in object oriented programming languages such as C/C++/C# is highly preferred.
4- Familiarity with acoustic, optics, and medical ultrasound is a plus.
5- Publications in internationally recognized journals or presentations at internationally recognized conferences is a plus.