

*If you are interested in the Ultrasound Optical Sensor, please contact Nancy Saucier, Director of New Venture Development at Nancy\_Saucier@uml.edu or 978-934-3212.*

## **Ultrasound Optical Sensor**

### *Medical Device*

### *Status: Stable Prototype Available*

This technology is a fiber optic photoacoustic ultrasound probe developed by Xingwei Wang from the Department of Electrical and Computer Engineering at UMass Lowell. This product can emit, steer, and detect ultrasound signals simultaneously on a single optical fiber tip. The probe is very compact equally about 125  $\mu\text{m}$  in diameter. Due to the entire optical operation principle, there is no electromagnetic interference (EMI) generated from the probe. Furthermore, the phased array technique eliminates the necessity of the bulky mechanical structure for the scanning. Meanwhile, the principle of the probe allows the probe to generate a wide bandwidth as well as a high frequency (100 MHz) ultrasound signal. Therefore, the fiber optic photoacoustic ultrasound probe is extremely suitable for high resolution ultrasound imaging or testing applications where the access is very limited.

The unique features mentioned above allow the probe to be used in medical applications. The material of the optical fiber is silicon dioxide which is bio-compatible and has no EMI generation which makes the probe a perfect device for usage in emergency rooms and operating rooms. Moreover, due to its compact size, it can be guided into the blood vessel to perform ultrasound imaging to locate stenosis. The worldwide medical ultrasound market was valued at \$2.99 billion in 2008 and is expected to reach a staggering \$5.18 billion by 2015.

In addition, this technology holds several competitive advantages including:

- Greater sensitivity and larger detection range
- Low cost and good repeatability in batch
- All silica sensor—compatible with EMI technologies
- Miniature size and ease of use

This technology has been optioned to Endeavor Medical Inc. for start-up commercialization as a Phase II product under development.

NVI is actively assisting Xingwei Wang and EMI through:

- Early strategy development and customer assumption testing
- Pitch development and market research
- Funding strategy and initial angel introductions
- Mentor and Advisory Board development
- I-Corps funding, as well as other applicable grant sources