Gas Analysis Using Ultrasonic

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There is no simple sensor for the direct real-time measuring of the concentration of gas mixtures to date. While there are a variety of different probes for gas measuring, these are usually limited to a particular gas or group of gases. By using ultrasonic waves for measuring the speed of sound in a measuring chamber, I was able to develop a new measuring method to analyze the concentrations of variable gas mixtures in real-time. The sensor reaches a very high resolution and high accuracy. Due to the small size of this sensor, it is suitable for both of these; for measurements in industrial plants, as well as for detecting the change of a gas composition. Thus, especially regarding occupational safety, small yet sensitive detectors and environmental measuring instruments for determining air quality and composition have been made a reality. Environmental measurement is important in order to warn of danger and react properly. As shown by bygone accidents, such catastrophes are an existing danger: The leakage of radioactivity, but also the emission of hazardous material and toxic gases can happen any time. In a further step of this project a measuring system was developed, which allows it to record large areas with different types of sensors. Those individual units use my measuring technology and are able to connect themselves to form a network and spread their measurements around the world via internet. Either connected as a network, or used stand-alone with a Smartphone, the sensors can warn of dangers, and therefore save lives.

Awards Won:

First Award of $5,000

Intel ISEF Best of Category Award of $5,000

Intel Foundation Cultural and Scientific Visit to China Award

Fondazione Bruno Kessler: Certificate of Honorable Mention

Spectroscopy Society of Pittsburgh: Second Award of $1,000