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STAR Analytical Services Receives Grant from Small Business Research Award

STAR Analytical Services announces the award of a $160,000 grant from the National Institutes of Health to apply advanced mathematical techniques to the development of smart sensors for assistive hearing devices. STAR received the Small Business Innovation Research (SBIR) award from NIDCD, an institute of NIH, to improve the lives of people with communication disorders.

We've all experienced the so-called "Cocktail Party Problem", the babble of many voices which is particularly difficult in echoing environments, such as restaurants and airports. STAR's solution, as research-team member Keith Gilbert points out, is designed to "let you listen to exactly what you want to listen to" despite the confusion.

This innovative research, conducted by Chief Scientist Dr. Joel MacAuslan and his team, will improve on algorithms for audio analysis. To hear a demonstration of this processing, with a stirring speech and a fascinating discussion of the mathematical techniques, review the samples here: http://staranalyticalservices.com/audio/JFK_Sample_Output_1.wav

You will hear the result as the system "learns" how the two microphones have mixed the two signals, and, after about 30 seconds, determines how to un-mix them. It does this with virtually no information about the sources, the sensors (microphones), or the environment — it determines all this information automatically, minimizing the requirements on the listener.

This system will allow listeners to focus on a particular source of sound against a background of interference. Drs. MacAuslan and Richard Goldhor explain that the research will further emulate what the human auditory system does very well. We use "binaural" hearing, the ability to interpret differences in the sounds arriving at our two ears, to focus on sounds of interest in the presence of competing noise.

In collaboration with UMass-Dartmouth's Professor Karen L. Payton, Department of Electrical Engineering, the research team will develop the system to separate unwanted signals and to extract desired ones, all automatically. This enabling technology can be applied to a wide range of applications, from toolkits that allow other researchers to analyze just the target utterances they are studying, such as a baby vocalizing, to better hearing aids.

STAR has expertise in enabling technologies that disentangle mixed sounds coming from independent acoustic sources. For instance, by placing a microphone near a known source, a listener can indicate whether this is a sound to be firmly suppressed, such as air conditioning during a baby's vocalizing, or to be enhanced, such as a conversation partner's voice. The long-term objective is to provide better recording and live listening experiences for clinical researchers and hearing-aid developers.

The SBIR program supports research and development of products and services by small business concerns which show strong potential for commercialization. For further information, see http://www.nidcd.nih.gov/

ABOUT STAR Analytical Services

STAR Analytical Services works with information intensive industries that require specialized mathematical and analytical expertise to for innovative projects. STAR provides expertise in mathematical modeling, image and signal processing, and algorithm development, creating the path to a solution for the most complex needs including: analyzing large volume data, creating a solution model & testing mechanism, and delivering a repeatable process for ongoing data analysis

Working hand-in-hand with business problem owners, STAR helps accelerate the solution process in industries ranging from aerospace, mapping, and surveillance to manufacturing, printing and neurosurgery. The company has particular expertise in complex systems, those with strongly interacting parts; in image and signal processing, and in knowledge-based (objective) speech and vocalization analysis. For more information: http://www.STARanalyticalservices.com

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