Researchers at the University of South Florida have developed an adaptive user-guided assistive listening system (ALS) that can enable people with hearing loss to hear and communicate effectively in multi-talker or noisy environments.

In 2000, a stakeholder's forum that included manufacturers, scientists, clinicians, and consumers identified a high priority need for ‘universal’ personal ALSs, citing a variety of limitations of current technologies such as personal frequency modulation (FM) systems. Chief among limitations, and still not yet addressed, is the need for dynamic user-selection of acoustic sources to enhance the ability of the hearing impaired to participate in group discussions that occur in school, work and social settings. Interfering speech, reverberation, and temporally-fluctuating background noise have a substantial impact on speech perception for these individuals. With the number of potential ALS users encompassing a large portion of the 31 million hard of hearing people in the US alone, it is clear that an improved ALS will be needed to meet this demand.

Our inventors have addressed this problem through devising an advanced ALS that uses signal processing algorithms for sound classification and enhancement. The system also leverages multiple microphones and delay-sum beamforming techniques to reduce the impact of room acoustics and coherent/incoherent noise sources. Included is a novel and sophisticated interface for user-guidance to a target talker that has the potential to greatly enhance ALS performance in multi-talker environments. Additionally, the device should work with many wireless (e.g., Bluetooth) compatible listener devices, including earphones, headsets, hearing aids, and cochlear implants. This invention will benefit individuals who experience communication difficulty in small to medium sized group listening situations with the potential to improve quality of life, social interactions, and effective communication in the workplace.

**ADVANTAGES:**
- Ergonomic user-guided location selection
- Supports multiple simultaneous users
- Wireless communication between the central system and personal ear-level hearing enhancement device

**Advanced Assistive Listening System**

**Acoustic Beamforming System Allowing User Guided Beam Steering Talker Selection**