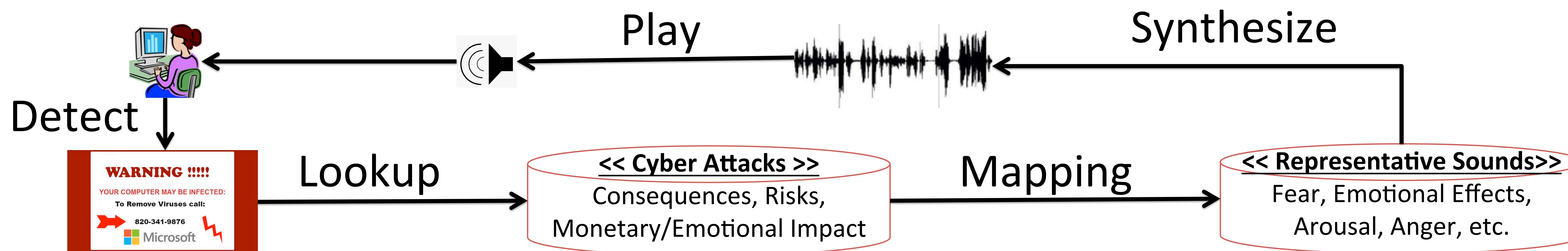# SBE: Medium: User-Centric Design of a Sonification System for Automatically Alarming Security Threats and Impact

Akbar Siami Namin, Keith S. Jones, David Sears, Rona Pogrund (Texas Tech University)

http://www.myweb.ttu.edu/asiamina/research_files/UserCentricSonification.html



**Key Problems and Challenges**:

- Enable secure, safe, informed, and alarmed Internet navigation for general users, and in particular for those who are visually impaired

- Avoid delivering a lot of technical textual jargon when communicating with users alarming them about the risks, impact, and consequences of cyber attacks

- Represent security warnings through unconventional and contemporary approaches

**Scientific Impact**:

- Understand how general users comprehend and perceive security attacks and their impacts

- Introduce sonification of cyber attacks, as a new approach, to enable usable and accessible security

- Communicate the risks and consequences of cyber attacks with users through representative sounds

- Build a framework to automatically translate cyber warnings to sounds with similar impact and effects

**Solution**:

- Use representative sounds to communicate risks, impacts, and consequences of attacks to users

- Design and identify representative non-speech, natural and artificial sounds to semantically represent meaning, impact, severity, consequences, and risks of each group of cyber attacks

- Label sounds and groups of cyber attacks with respect to emotional impact, anxiety, arousal, fear, etc.

- Map each cyber attack to a representative sound with a similar level of emotional impact and play this sound whenever attack occurs

**Impact on Society**:

- Auditorily alarm users about cyber threats without any need for technical knowledge

- The technology can be integrated into existing user interfaces, antiviruses, and security utilities

- Enables users to decide about cyber attacks faster and more informed

**Impact on Education and Outreach**:

- Train sighted and visually impaired participants of the studies about attacks and their consequences

- Introduce a taxonomy of cyber attacks to help software developers consider the consequences of attacks on stakeholders when designing a software application

**Quantify Potential Impact**:

- Over 130 cyber attacks collected

- Consequences and impacts on users for each cyber attack described

- The consequences of attacks grouped into 7 distinct clusters

- 7 clusters will be sonified, representing the most significant cases

**Award ID#: 1564293**