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

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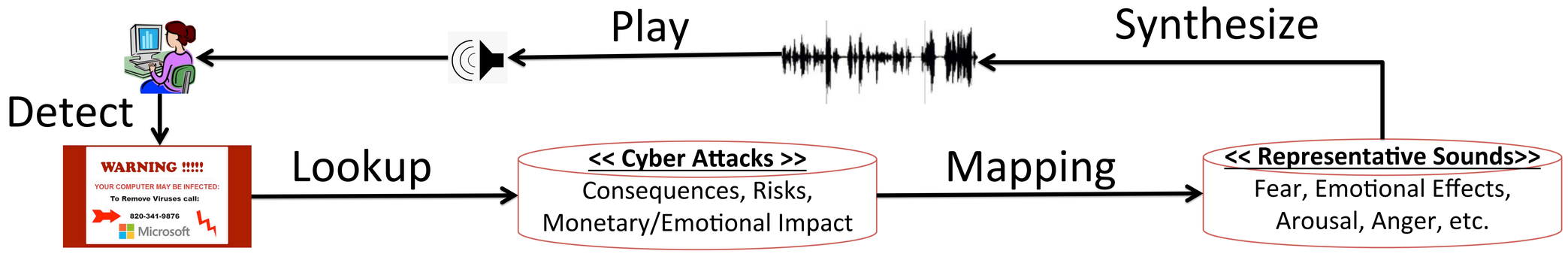
http://www.myweb.ttu.edu/asiamina/research_files/UserCentricSonification.html



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

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