Designing Secure and Usable Wake Words

(Technical Report)

Reclaiming the Road: How Agendas for American Car-free Cities are Advancing in the COVID Era

(STS Research Paper)

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Preface

How can current sociotechnical systems be modified to be more intuitive and people-centered? Though innovation is ubiquitous, not all of it serves human wellbeing or social benefit. Technology consumerism favors innovation for innovation's sake, and the effects can be hazardous. Existing sociotechnical systems can be modified to increase people's privacy, safety, and wellbeing.

Voice-controlled devices such as Amazon's Alexa and Google's Google Home are always listening to audio input, searching for a keyword known as the "wake word" before streaming subsequent audio input to the cloud for further processing. Unfortunately, when wake-words were first designed, very few were designed with security or usability in mind. Because of this, accidental triggers can occur from anything, ranging from normal conversation, to TV and radio, to other malicious voice-controlled device skills. This project designs wake-up words which limit the number of accidental triggers from misconstrued audio signals. Phonetic edit distance and word frequency are used to determine suitable wake words, and tested against a word recognizer for accidental triggers.

During the beginning of the COVID-19 pandemic, urban transport stalled as people stayed at home or quarantined. Cities needed to find new ways to attract customers to struggling businesses and ensure enough space for socially-distanced recreation. The solution was opening up sidewalks to storefronts and occasionally the entire road to pedestrian and bike access. City council officials are fighting to make these temporary programs permanent, supported by citizens and urbanist, pedestrian, and bicyclist advocacy groups enjoying the benefits of more accessible roadways.

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