

Research Statement

EUNSOL CHOI (www.solchoe.com)

My research goal as a user experience (UX) researcher and a design engineer is to **construct trust in user interactions toward emerging technology**. The central tenet to this approach is a comprehensive understanding of cognitive human factors and the human-centered design of technology. However, my question in particular is how the human-centered methodology can be especially different in the more deeply related matters of life. The immersion of technology has been hesitant in conventional fields in which the experiences are closely attached to sensitive emotions and have been practiced for so long such as: mourning rituals, and culinary and dietary practices. The research problem with adopting new technologies to the affective sphere is that it requires special effort to: a) discover what makes the experience sensitive and needs to be emotion-aware, and b) extract values to enable the trust before design implementation. My interest in empirically excavating human inherent needs for an affective human-computer interaction stems from my own interest in building novel technologies and unconventional interfaces in everyday life.

In my recent works, I have coauthored three publications and single-authored one, one of which is provisionally accepted at the *International Journal of Human-Computer Interaction*, one submitted to the *ACM Transactions on Computer-Human Interaction*, and one I have presented at the *IFIP Conference on Human-Computer Interaction (INTERACT)* 2021:

1. I enhanced the **trust of review data** and rating system using social computing, Natural Language Processing, and sentiment analysis. Users and companies can extract subtext from burgeoning reviews that can be detrimental to the business if not acknowledged. Exploring the vast review text through social computing and incorporating topic modeling, I further improved the objectivity of review context and suggested ways to enable emotion-aware review data extraction.
2. I also achieved **trust in human-food interaction**. While all humans have natural fear toward accepting novel foods, I assessed the perceived distrust on a novel food item and used technology as a mediator to familiarize the food item. I designed an empirical sensory workshop for a universal flavor dissemination and mechanically built multisensory food kiosk that yielded trust toward a novel food and hence, toward the technology.
3. I attempted to discover **trust factors between human and artificial intelligence (AI)**. The inherent distrust embedded in human-AI interaction propelled the study of designing AI chatbot personas suited to the user personality type and observing the surrounding trust factors in their interactions. A human-AI collaboration can be enriched through the comprehensive understanding of AI trust factors.
4. Finally, I attempted to bridge **the trust gap between death and digital technology**. Using in-depth user research and qualitative analysis, I could counter the tacit restraint to discuss death online and re-designed social media and its abundant archive of digital traces as an effective commemorative space.

My specific and current interest lies in using social computing and sentiment analysis to enhance daily food selection procedures. I am also passionate about using mechanical engineering and design for multisensory interaction and integration, focusing on how to provide humans with equal opportunities to feel and taste different objects. I am committed to understanding and designing multisensory interactions not only for the sake of immersive systems or enriched sensory experiences but primarily to enable universal

understanding of taste regardless of user’s functional capabilities. Mere exposure to multiple sensory information has also been shown to tackle nutritional conditions such as food neophobia or selective intake disorder, from my previous study. The prerequisites to effective multisensory implementation in everyday eating environment must be: a) understanding of distrust and discomfort on intervening technology in eating practices, b) alignment of sensory stimuli concerning users’ varying sensory capabilities, and c) establishment of a design framework for universal flavor dissemination. After the requisites are established, I am also keen to build new interfaces or wearables and technologies suited to an everyday life experience.

My future research topics include but are not limited to:

1. Making sense of foods through computational methods.
2. Understanding cognitive behaviors on multisensory technology.

Making ‘sense’ of foods through computational and sensational methods is the umbrella topic of my diverse research skills. With food, even after thousands of years of modern eating practices, humans can still only taste food through direct consumption, with fully functional physical senses, and is otherwise left to the imagination. My vision to this issue is that everyone should have universal access to what others may feel, convey, and receive what is conveyed with the use of technology. My research approach comprises four main ideas: a) representing taste data with olfactory, auditory, tactile or a combined form of interfaces, b) crafting mechanical exertion of multisensory stimuli, c) recommending food in response to user sentiment through emotion-aware computing, and d) creating multisensory food selection process for users with or without sensory impairment.

Understanding the cognitive behaviors on multisensory interactions is requisite to build the common trust of the technology. Multisensory technology has been taking forms of wearables, interfaces, or virtual reality, excellently using multiple sensory modalities for hedonic and immersive experiences. Yet, little light has been shed on psychological and cognitive acceptance of such technology. There have been the unsolved issues of multisensory experience being overwhelming and psychologically exhausting to many, especially when involving emotionally intertwined items like food. However, if leveraged correctly, it has much potential to correct dietary conditions through sensory amplification and help us get accustomed to unfamiliar foods, which will otherwise take costly measures by the government or long-term programs. I will employ test environments positioned in daily life than in laboratory settings to measure the feasibility of its everyday use and use in-depth user experience research methods to empirically analyze user interactions upon sensory-rich exposure.

I ensure that such contributions will provide the stepping stone for restaurants, cafes, and many other environments to help people remotely feel, taste, and discover the flavor without full equipment of sensory abilities and for vast disciplinary fields including psychology and accessible technology.