

**Dept. of Electrical Engineering
School of Electrical, Computer and Energy Engineering
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Social Interaction Assistant

An assistive and rehabilitative technology to enrich social interactions for individuals who are blind and visually impaired

PhD Proposal Defense
Sreekar Krishna

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Committee

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Abstract:

Social skills are vital for everyday interactions between individuals and these interactions incorporate the elements of both verbal and non-verbal cues. While the verbal cues refer to the actual information conveyed through speech, the non-verbal communication involves complex mannerisms and gestures that are left to the cognition of the interaction partners to decipher and react to. A major portion of these non-verbal cues are visual in nature which in turn renders them inaccessible to people who are blind and visually impaired. In this proposal, we discuss how efficiently can some of these important non-verbal communicative cues be extracted and conveyed to the participants of social interactions who are blind and visually impaired. Methodically, we establish the importance of visual non-verbal cues and develop technologies for efficient sensing and delivery of these cues to the users of the social interaction assistant. From the sensing perspective, important issues involved in the extraction of non-verbal cues from the user (egocentric sensing) and from their interaction partners (exocentric sensing) are discussed. From the delivery perspective, novel human computer interfaces are introduced which can subtly allow access to both assistive and rehabilitative cues for people who are blind and visually impaired. Three important problems pertaining to social interactions, namely, rehabilitation from stereotypic body mannerism, sensing and delivery of proxemics (non-verbal cue of distances between interaction partners) and, the sensing and delivery of facial mannerisms will be discussed in detail. While the first two problems are discussed from design through development to user testing, proposed implementation details on the third problem will be presented. In discussing these problems, two important aspects of real-time sensing of non-verbal cues and efficient delivery of extracted information to the user will be carefully considered. Potential socio-computational models for understanding and predicting of socio behavioral aspects of everyday interactions will be introduced. Specific example of such a model pertaining to the problem of sensing and delivering of facial expressions & mannerisms will be highlighted.