IGERT: Integrative Approaches to Bilingual Cognition and Interaction

David Novick, The University of Texas at El Paso

**Intellectual Merits**

The major research efforts in this project grow from the confluence of cognition and computation, particularly for language, interaction and bilingualism. The project’s faculty and students will address core research questions that require insight and expertise from both psychological and computational perspectives. These questions primarily involve understanding (1) the nature of bilingual language processing, combining cognitive and computational methods, and (2) how to develop real-time conversational systems based on cognitively accurate models for bilingual populations, especially at time scales of 300 milliseconds and below. New directions in research, made possible by the project’s interdisciplinarity, will include the study of: how language proficiency impacts memory processes, such as encoding, retrieval, forgetting, use of strategies, rate of learning, and types of errors; how language context may influence accessibility of lexical, phonological, and orthographic representations in the two languages, using eye-movement tracking methodology to more precisely measure processes of bilingual reading; cross-language use of interaction cues such as non-lexical utterances and non-verbal communication; and modeling gaze in natural multi-party conversations, at the 100-millisecond time scale, and in bilingual contexts. From this research, we expect to see develop results that, because of the project’s interdisciplinary approaches, are more consistently rigorous methodologically and more informed in their insights.

**Broader Impacts**

This project launches a new initiative to integrate Ph.D. education and research in Computer Science and Psychology, with extension planned to Linguistics and Education. The project’s specific focus will be the connections between cognitive models of language and cognitive models in human-computer interaction, with a particular emphasis on bilingualism. The project will play a major part in a university-wide initiative on research and education in the interdisciplinary field of language and cognition. The project will serve as a model for development for integrating doctoral programs across college and departmental boundaries. Students served by the project will include significant numbers of Hispanics; over 70 percent of UTEP’s 19,000 students are Mexican-American, and another 12 percent are Mexican nationals. Service to students would be both directly, through training in the project, and indirectly, by providing role models that would encourage undergraduate students to pursue doctoral education. The project proposal would request levels of funding more modest than the maximum offered by the IGERT program.

Key Words: Social Sciences, Computer Sciences, Language, Cognition