

“Natural Interfaces for Information Systems”



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How can computers faithfully reproduce a sense of face-to-face communication? High-speed networking is globally pervasive, enabling collaboration and communication that is largely independent of geography and time. Invariably, machines mediate the process and augment human actions. Toward this end, ease of use is a legitimate research target for harnessing technology that serves a greater population. Ideally, one desires user environments that capture features of face-to-face information exchange in which signaling occurs in simultaneous sensory dimensions—primarily sight, sound, and touch. While current implementation cannot offer spatial realism in these dimensions, primitive component technologies can be brought together to initially address multimodal applications. Speech usually bears a primary burden, so advances in automatic speech recognition, text-to-speech synthesis, and acoustic transduction can be used. Visual imaging of gestures complements speech and provides emphasis, disambiguation, emotional indicators, and identification. Tactile interaction and manual gesture with force-feedback further complement the exchange and are especially valuable when manipulating graphics. To integrate and interpret simultaneous sensory input requires a strategy for fusing technology while preserving the context of communications. A prime research objective is to reliably estimate the intent of users and come up with an intelligent response. In this presentation, Dr. Flanagan will characterize the current research challenges and summarize fledgling progress in multimodal communication.

Dr. James Flanagan has enjoyed two careers – in industry, and in academia. After 33 years with AT&T Bell Laboratories, Flanagan joined Rutgers University in 1990. At AT&T, he was Director of Information Principles Research, and had responsibilities for departments conducting research in digital communications and networked information systems. Dr. Flanagan holds SM and ScD degrees in Electrical Engineering from M.I.T. He has published approximately 200 technical papers in scientific journals and is the author of a research text *Speech Analysis, Synthesis and Perception* (Springer Verlag). He has received many scientific awards, which include the National Medal of Science 1996 and most recently the IEEE Medal of Honor 2005.



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