

## MultiSense and SimSensei

A Multimodal Research Platform for Realtime Assessment of Distress Indicators

Co-Principal Investigators: Albert “Skip” Rizzo and Jonathan Gratch

This research effort is developing a platform where a virtual human, an interactive computer-generated character, can automatically identify indicators of psychological distress, such as depression, anxiety and post-traumatic stress. Two technological systems - utilizing advances in the fields of machine learning, natural language processing, computer vision and human computer interaction - are central to the effort:

- **MultiSense** automatically tracks and analyzes in real-time facial expressions, body posture, acoustic features, linguistic patterns and higher-level behavior descriptors (e.g. attention and fidgeting). MultiSense infers from these signals and behaviors, indicators of psychological distress that directly inform the virtual human.
- **SimSensei** is a virtual human platform specifically designed for healthcare support. Based on ICT’s nearly 15 years of virtual human research and development, the platform enables an engaging face-to-face interaction where the virtual human automatically reacts to the perceived user state and intent, through its own speech and gestures.

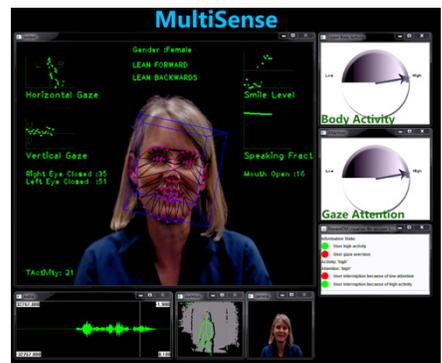
In the current system, users interact with Ellie. Ellie is not a therapist. She is an interviewer or screener, who can ask questions and “listen” to answers. She does not give advice or make diagnoses. MultiSense and SimSensei were funded by DARPA and the U.S. Army Research Lab (ARL).

### Objective/Goals

The effort aims to enable a new generation of clinical decision support tools by providing an artificial and recognize signs of distress, make diagnoses, and track changes over time. The hope is that the project’s computer-based delivery system can improve access to care while reducing the stigma of seeking help. Studies of the system suggest that people are willing to disclose more to a virtual human interviewer, than to a real person, in large part because computers don’t judge people the way another human might.

### Other Work

SimSensei can be applied to any number of question and answer scenarios where a virtual human interviewer could be useful (e.g., taking medical histories or checking in with elderly people at home alone). MultiSense’s sensing system can be applied in other areas, including education and training, like ICT’s **Cicero** project where it is used to evaluate public speaking performances.



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