Leveraging Multimodal Dialog Technologies & AI/ML for Patient Health Diagnosis, Monitoring, and Intervention

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Using conversational speech and video technologies in conjunction with signal processing and machine learning algorithms can allow patients to interact with an engaging virtual agent in the comfort of their homes, producing various automatically-computed, clinically-validated measures of disease onset and progression that can help those patients, as well as their supervising physicians and caregivers in diagnosis, monitoring and understanding.

Diagnosis & monitoring of neurological health in patients remain a critical need and challenge

- lack of access to neurologists or psychiatrists
- lack of awareness of a given condition and the need to see a specialist
- lack of an effective standardized diagnostic or endpoint for many of these health conditions
- substantial transportation and cost involved in conventional or traditional solutions
- severe shortage of medical specialists in these fields to begin with

Patients/clinicians are provided with a secure web link to the assessment

Users guided to set up their webcam and microphone before interacting with agent

Users interact with an agent and fill out clinical surveys

Analytics modules extract speech and video metrics automatically

- **Speech:**
  - speaking rate
  - intelligibility
  - mean pausing duration
  - mean F0
  - duration

- **Video:**
  - opening, width, displacement, velocity, acceleration and jerk of the upper and lower lips
  - mouth surface
  - mean symmetry ratio between right and left mouth surfaces
  - vertical positions of eyebrows
  - eye opening
  - head tilt translation and rotation vectors

Dashboard provides easy visualization!