TECH OFFER

Conversation-Aware Virtual Patient For Mixed Reality Medical Training

KEY INFORMATION

TECHNOLOGY CATEGORY:
Healthcare - Telehealth, Medical Software & Imaging
Infocomm - Speech/Audio Processing
Infocomm - Natural Language Processing & Semantic Technology
Infocomm - Artificial Intelligence
Infocomm - Augmented Reality, Virtual Reality & Computer

TECHNOLOGY READINESS LEVEL (TRL): TRL8
COUNTRY: SINGAPORE
ID NUMBER: TO174523

OVERVIEW

Virtual Reality/Mixed Reality (VR/MR) solutions involve high setup costs and a long development time; typically requiring between 4 weeks to 6 months just to construct a training scenario which is frequently prohibitively limited in scope and flexibility. With such long lead times, the application of scalable medical training is a challenge for the medical training industry - limiting access for many medical practitioners.

This technology offer is an AI-powered medical training simulation utilising mixed reality and virtual reality to improve healthcare training for healthcare workers. It enables the creation of a wider variety of medical scenarios via its virtual patient engine and understands the verbal responses of medical learners via a conversational AI engine which also recognises a dictionary of medical

phrases and drug names that are relevant to a clinical summary.

TECHNOLOGY FEATURES & SPECIFICATIONS

Virtual Patient Engine:

- Able to simulate rare disease/symptoms and various types of patient medical history, derived from real-world statistics
- Physiological problems are reflected virtually i.e. elderly with back pain, young patient with abdominal discomfort etc.
- Built-in reusability and effortless customisability
- Each patient profile is imbued with a unique set of presenting symptoms, history of illness, drug history, family history, social history which can be tweaked in real-time and neccessitate a differentiated line of questioning - forcing learners to change the examination approach and effect a different learning outcome
- Reacts to user's line of questioning, interactions and choice of management

Conversational Artificial Intelligence:

- Multilingual
- Understands the correct order and flow of realistic conversations
- Identifies the intent of conversations between medical practitioner and patient
- Recognises medical phrases and drug names that are a requisite part of clinical summaries

POTENTIAL APPLICATIONS

This technology supports the learning needs of medical practitioners in the following broad areas:

- Experiential - translate textbook content to virtual reality
- Interdisciplinary training - peer-to-peer interaction with tutors, colleagues from anywhere and on any device
- Real-time scenario controller - create and modify scenarios in real-time, resulting in observable changes to the virtual patient
- Assessment - standardized formative evaluation to assess student capabilities and remove accessor bias

At present, the following medical training scenarios are supported (although not limited to):

- Healthcare literacy (Orton-Gillingham card drills)
- COVID-19 swab test supervision
- Clinical examinations
- Ophthalmology examinations (ocular)
- Physical examinations
- Paediatric distress recognition

UNIQUE VALUE PROPOSITION

Compared to existing techniques, the technology is unique with a fully customisable virtual patient that is readily configurable with different physiological profiles, paired with a conversational engine that understands and orchestrates the virtual patient's responses to a medical practitioner's line of conversation. The following benefits can be obtained from this the standardisation of medical training through the use of this technology:

- Improved clinical outcomes - repeatable observational learning of complex procedures for reinforced enhanced clinical knowledge, competency, and knowledge retention
- Decentralises the classroom - moving away from fixed learning places to remote learning spaces
- Scalable - wide spectrum of simulated pathologies and adjustable symptoms
- Assesses learner's critical thinking and adaptability - inject scenarios to assess how learners analyse, manage and adapt to unpredictable and unexpected scenarios
- Reduced setup/development time (by up to 95%) and cost

The technology owner is keen on technology collaboration with medical institutions, hospitals, medical device companies, deep tech companies and VR/MR game developers to co-develop new products/services. Additionally, the technology owner is interested in opportunities for test-bedding/clinical studies.