PURDUE INNOVATES | Office of Technology Commercialization

ProceduAR: An Augmented Reality-based Tool to Create Asynchronous Procedural 3D and 2D AR Instructions

This in-situ 3D augmented reality instruction platform uses advanced algorithms for enhanced computer vision to provide interactive, high-precision training and task guidance.

Researchers at Purdue University have developed a new in-situ 3D augmented reality (AR) instruction platform, known as ProceduAR. There is a growing demand for using AR to train workers to develop highly technical skills; however, many current AR instruction programs are expensive to create and are thereby not being widely implemented. Purdue researchers meet this challenge by introducing new algorithms to computer programs that allow for enhanced computer vision with 3D interfaces. Unlike manual training techniques such as pen and paper or verbal cues, AR is interactive and can detect spatial differences while someone completes a task with higher precision than the human eye alone. In testing with a prototype, the AR system was able to identify objects that one might use to complete a task, the user's movements in operating such tools, and readily captured voice instruction. Purdue researchers conducted a study of three unique experiments where participants either assembled an engine, repaired a bicycle wheel, or installed a shelving unit and 85% of users were able to successfully complete these tasks using ProceduAR.

Advantages:

-Rapid Human-Computer Interaction

-User-Friendly

-Cost Effective

Potential Applications:

-Training

-Manufacturing

Technology ID

2020-RAMA-69136

Category

Artificial Intelligence & Machine Learning/Computer Vision & Image Recognition
Robotics & Automation/Perception & Sensing
Education & EdTech/Industrial & Workforce Training Platforms

Authors

Hank Huang
Subramaniam Chidambaram
Karthik Ramani

Further information

Matt Halladay
MRHalladay@prf.org

Erinn Frank
EEFrank@prf.org

View online

-Machine Learning

Technology Validation: Participant study

Recent Publication:

Purdue Newsroom

"Hands-On with Augmented Reality in Remote Classrooms"

â€‹www.purdue.edu/newsroom/releases/2020

TRL: 3

Intellectual Property:

Provisional-Gov. Funding, 2020-06-30, United States

Utility Patent, 2020-10-30, United States

CON-Patent, 2022-07-05, United States

Keywords: ProceduAR, augmented reality instruction, AR training, in-situ 3D AR, enhanced computer vision, 3D interfaces, technical skills training, rapid human-computer interaction, cost-effective AR, procedural 3D AR instructions, Algorithm, Augmented Reality, Computer Programming, Computer Technology, Computer Vision, HCI, Human Body Communication, Machine Learning, Mechanical Engineering, Virtual Reality