PURDUE INNOVATES | Office of Technology Commercialization

AdapTutor: An Adaptive Tutoring System for Machine Tasks in Augmented Reality

This augmented reality training platform uses pre-recorded tutorials overlaid on the real world and adaptively adjusts the difficulty level to allow workers to learn independently and more efficiently, increasing productivity and scalability.

Due to the high demand for flexible and configurable manufacturing processes, workers face new challenges as they rapidly attempt to adapt to new machine operations. Conventional training methods require experienced team members to train new ones, resulting in decreased productivity, while also preventing scalability. To solve these issues, researchers at Purdue University have developed the AdapTutor, an augmented reality (AR) training platform that allows trainees to view pre-recorded tutorials overlayed on the real world and learn independently and more efficiently. This platform continually monitors the user's characteristics to adjust the difficulty level of the content adaptively. This technology allows for a more efficient way of training the workforce without losing training quality and productivity.

Advantages:

- No need to use expert labor resources for training

- Reduced training time

- Scalable approach to training

- Greater trainee satisfaction

Applications:

- Manufacturing

- Technical training

- AR Education

Technology Validation:

Technology ID

2021-RAMA-69246

Category

Robotics & Automation/Simulation, Digital Twins, & Industrial Automation
Education & EdTech/Immersive & XR Learning Environments
Education & EdTech/Industrial & Workforce Training Platforms

Authors

Yuanzhi Cao
Gaoping Huang
Alexander J Quinn
Karthik Ramani
Tianyi Wang

Further information

Matt Halladay
MRHalladay@prf.org

Erinn Frank
EEFrank@prf.org

View online

This technology has been validated through a study where 21 of 24 participants used and preferred AdapTutor over non-adaptive training approaches. Users cited improved memory of how to complete tasks while not having to repeat content that they are already proficient in.

TRL: 6

Intellectual Property:

Provisional-Patent, 2020-11-03, United States

Provisional-Gov. Funding, 2021-03-17, United States

Utility-Gov. Funding, 2021-11-03, United States

CON-Gov. Funding, 2025-06-03, United States

Keywords: augmented reality training, AR platform, workforce training, adaptive learning, manufacturing training, technical training, employee upskilling, reduced training time, scalable training, AdapTutor, Augmented Reality, Computer Technology, Employee Training, Machine Learning, Machinery, Mechanical Engineering, User Interface