

Research Focus:

Identify the state of the art experiential learning opportunities that are provided through gamification in other sectors and assess their potential to increase knowledge transfer in ATC training.

Goals:

Objective 1: Develop pre- and post-game evaluation metrics that tie gamification elements to desired student learning outcomes and knowledge transfer related to improved job performance.

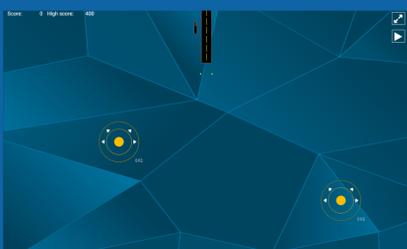
Objective 2: Identify ATC-relevant scenarios and environments where a comparison could be made between traditional instruction methods and those that use gamification elements, including: simulations on multiple formats, team-based problem solving, collaboration, wargaming, where learners role play to achieve desired outcomes in a competitive environment.

Objective 3: Develop a gamification scenario and concept that tests the knowledge transfer hypothesis and achieves the desired student learning outcomes of improved student knowledge uptake in ATC-relevant scenarios and environments.

Objective 4: Analyze and report on the proof-of-concept scenario and its effectiveness in improving learner knowledge uptake. Make recommendations for future research.

Research Approach:

Our team developed a game that would challenge users to direct an aircraft to land in crowded airspace from an immersive 3D perspective, instead of a top-down 2D perspective. The team used the Microsoft HoloLens platform to provide a first-person perspective from which to direct air traffic.



2D game



3D game



First-person perspective



Why is this Research Valuable?

Augmented Reality (AR) devices have many advantages that the FAA can leverage to improve training experiences, including:

Improving learner engagement - AR provides a low-cost immersive environment

Incorporating evolving technologies into the training environment - AR technology is a new technology with training applications (systems training, procedures and processes, video conferencing, and digital reference library)

Impact of this Research:

The team explored the toolset that the HoloLens offers, including gaze, gesture, and voice recognition and applied it to an immersive 3D environment.

For future research efforts, the team recommends:

- * Exploration of **shared experiences** (more than one HoloLens viewing the same scene)
- * **Spatial mapping** to allow adaptation of the game environment to the physical world
- * Application of AR to **procedure training tutorials** and **testing trainee performance**