Discovery Machine® Inc.
Artificial Intelligence Software for Expert Knowledge Capture and Automation

Virtual Instructor Pilot Exercise Referee (VIPER™) Pilot Training Next (PTN)

Virtual Reality (VR) is a promising instructional technology. AR can be leveraged to create a realistic environment where the student can suspend disbelief and experience scenarios that provide training. AR provides an on-demand, safe, and engaging approach to learn. It is tempting to believe that a student pilot armed with AR technology will be magically transformed into an expert pilot. As promising as AR technology is, AR by itself cannot turn novices into experts.

Productive practice requires a mentor – an instructor pilot (IP). The saying, "Practice makes perfect" is true but only when the practice is correct. Negative training is a risk that must be considered in any training environment. VIPER™ enables the learning of correct mental models in an AR environment without the presence of an IP. VIPER™ enables the PTN project to achieve the desired goal of on-demand independent training.

VIPER™ interacts with students using the same instructional strategies and interaction styles as a live IP. VIPER™ uses natural language to demonstrate and coach flight maneuvers. Like an IP, VIPER™ will consider general knowledge, basic aircraft control, situation awareness, task management, and risk management/decision making. VIPER™ has a representation of each student's mental model to the ideal mental model in order to track the student's proficiency. The proficiency is used to identify and address gaps in knowledge, choose instructional strategies, and help the live IP help the student.

Discovery Machine, Inc. (DMI) provides a methodology and technology that allows us to capture the mental models of experts, including both their understanding of a device and processes. DMI's artificial intelligence and cognitive modeling is focused on capturing the way experts reason. This enables us to provide "Virtual Instructors" that can direct each individual novice in how to carry out expert analyses independently. DMI's virtual instructors track the evolving mental models of each trainee to tailor training to their specific needs. These virtual instructors work with any simulation technology. As such, DMI's technology provides the perfect complement to VR solutions.

A great military is made by empowering its workforce with the knowledge and expertise to make efficient and effective decisions. A vast amount of knowledge resides in the heads of key individuals – these experts have immense demands on their time. Their expertise is difficult to replicate and transfer to a novice. DMI uses our knowledge capture methodology and visual modeling language to rapidly capture expertise from Subject Matter Experts and deploy the expertise as virtual instructors.

Operational need:
- Address shortage of Airforce (AF) pilots and instructors
- Innovate and revolutionize pilot training
- Make training cheaper, better, faster

AF Improvements:
- Instruction adapts to the student's need
- Access to training scenarios in an on-demand environment
- Student pilots gain confidence by practicing with no-risk
- Instructor pilots focus on critical skills rather than rudimentary basics

Related Articles:
- *Researchers test virtual reality Adaptive Flight Training Study at Columbus AFB*
- *Virtual Skies: Air Force hopes 'fun' tech transforms pilot learning*
- *Hey, Siri, How do you fly an F-35?*