
KWYN™
KNOWS WHAT YOU NEED
ADAPTIVE
INTELLIGENT
TRAINING
charles river analytics

KWYN™

KNOWS WHAT YOU NEED

Adaptive intelligent training solutions

The world is moving fast, and you need a large workforce of skilled people ready to do their jobs. KWYN technologies puts AI into your training program to accelerate skills acquisition and retention. Our suite of KWYN products fulfills the needs of the next generation of training; they are faster, smarter, and more optimized than older training methods. KWYN supports multiple industries—medical, aviation, space, and more.

Crucial benefits

- Accelerates knowledge acquisition and retention
- Reduces human error
- Enables faster decision-making
- Facilitates personalized learning journeys
- Reduces costs, increases return on investment
- Fosters continuous feedback and improvement cycles
- Provides objective assessment

Key features

- AI platform enables automated scheduling, scenario generation, content generation, and performance tracking
- Simulation- and competency-based training
- Ability to customize and personalize training for different learners
- Quantitative measures of success
- Customized fidelity along the pathway to learning
- Integration with existing courses

Backed by 30 years of research and development, we build KWYN technologies with integrity and a spirit of continuous improvement.

With adaptive intelligent training, you can reduce training costs and improve skill levels across your organization.

What is adaptive intelligent training?

Adaptive intelligent training optimizes the learning process by:

- Adapting to individual needs—training is tailored to an individual and progresses them as quickly as possible along their unique learning path
- Applying AI to make training more effective and efficient over time with scalable techniques
- Empowering the individuals and the organization to deliver peak performance

What are the benefits of intelligent adaptive training?

Adaptive intelligent training lets you:

- Achieve a higher skill level across trainees in the same amount of time by holding training time constant
- Train groups faster, whether individuals have the same or differing skill levels, by holding training criteria constant

KWYN products

KWYN™ MAGPIE

Adaptive game-based training for aviation maintenance

KWYN™ SOLAR

A mixed-reality application suite for space domain awareness

KWYN™ EFECTIVE

A virtual training system for medical and logistics personnel

KWYN™ MASTERY

An adaptive digital flashcard app that integrates with existing courses

An adaptive, game-based training environment

KWYN MAGPIE combines an integrated suite of efficient content-authoring tools, models of trainee skill and motivation, and a game adaptation engine to dynamically deliver game-based maintenance training that is responsive to individual learning needs, performance, and instructor guidance. Our scientists and software engineers designed and developed the maintenance training based on an adaptive game-based environment using our pedagogic interpretation engine.

KWYN MAGPIE includes an intelligent tutoring system (ITS) that provides both real-time performance assessment and an ability to construct proficiency models to understand the trainee's current skills and skill gaps. The system's ITS adapts training material, student help, and instructor support to the needs of the individual user. We deployed KWYN MAGPIE at Sheppard Air Force Base, where instructors and students are actively using it for F-15E avionics maintenance training.

"KWYN MAGPIE dynamically adapts both the scenario and the mechanics of the game to maximize training effectiveness over time, providing individual aircraft maintainers with customized training for key tasks," explained Sean Guarino, Principal Investigator on the project at Charles River. "This adaptation is based on the trainee's performance, instructional design theory, and motivational theory; it helps to ensure that the trainee has a beneficial and appropriate training experience when instructor guidance is limited."

EAGLE intillegent virtual trainer Image: KWYN MAGPIE

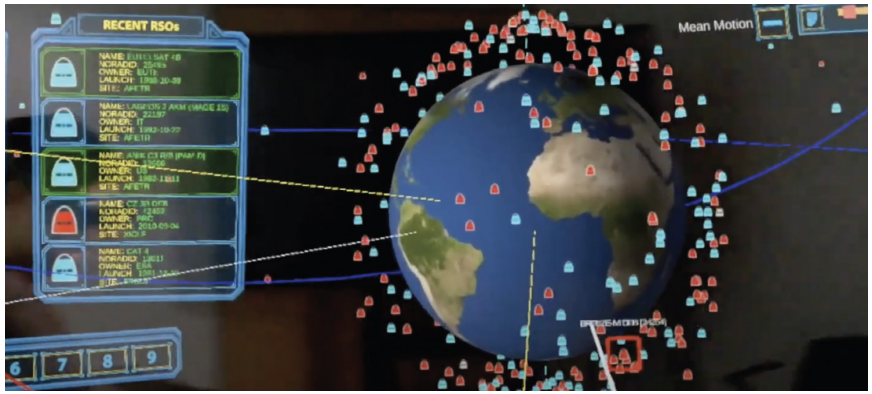
Mr. Guarino added, "KWYN MAGPIE promises to reduce training costs in two ways. First, it provides rapid and intuitive authoring that allows course designers to construct new training content with limited software engineering support. Second, it reduces the cost of training exercises by allowing instructors to manage large classes in a virtual maintenance trainer, reducing necessary time and potential costly errors on live vehicles and partial task trainers."

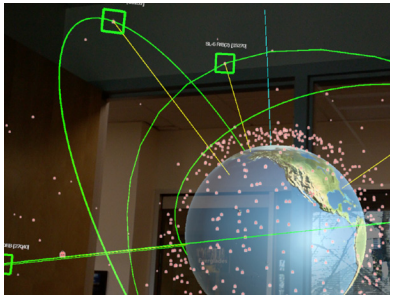
KWYN™ SOLAR

An extended reality suite for space domain education and training

KWYN SOLAR provides the next generation of space operators, analysts, instructors, and students with intuitive, engaging, and scalable education tools that can be accessed and edited anywhere to enhance operators' understanding of complex multidimensional space concepts such as orbital dynamics.

KWYN SOLAR's extended reality (XR) visualization capabilities provide a unique, validated solution that increases domain awareness for complex, multi-domain concepts that are inherently 4D.



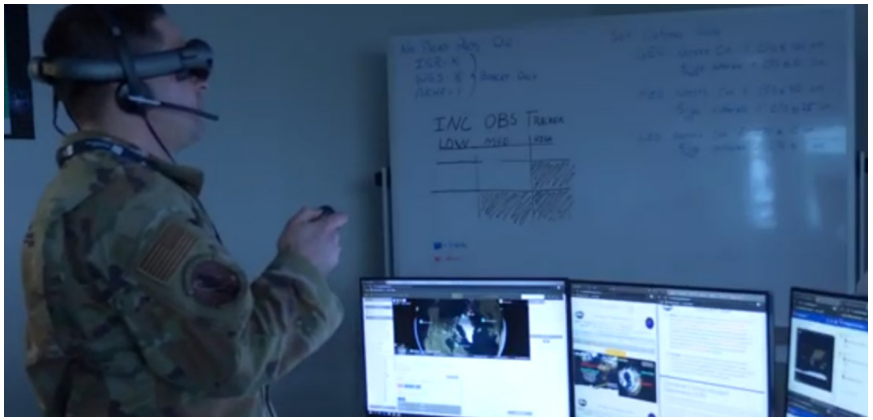


KWYN SOLAR runs with a web-based application for a variety of educational and training environments.

KWYN SOLAR enhances 3D visualization of complex spatiotemporal relationships to enable custom annotation and planning, facilitate development of 2D and 3D briefings, streamline access to controlled information for specific users, and support co-located and distributed collaboration in shared 3D environments.

KWYN SOLAR creates a custom XR experience contextually tailored to individual and information needs to maximize education and training effectiveness based on deep human factors expertise and experience leveraging multiple COTS headsets.

3D visualizations, filtering, and annotation tools enhance spatiotemporal understanding and space domain awareness. Device and web networking enables collaboration, data streaming, and custom configurations with rapid content sharing between 2D and 3D mediums.



A virtual training system for medical and logistics personnel

KWYN EFECTIVE is the Department of Defense's first comprehensive system to train military personnel on medical care and logistics in austere, far-forward environments. KWYN EFECTIVE lets medical professionals safely visit—and revisit—a challenging environment, better preparing them for real-world scenarios.

KWYN EFECTIVE captures important decision-making themes based on existing resources and past experiences of military medical personnel and then automatically assesses trainee proficiency against objective performance metrics linked to these skills.

Existing training methods for mass casualty incidents require the assembly of large numbers of specialists in real-world enactments, where manikins or actors play the victims. Due to this complexity, these large-scale events do not happen very frequently.

In contrast, KWYN EFECTIVE enables a modern, gamified experience that immerses medical personnel within realistic exercises in virtual environments that are accessible from anywhere via their computers, VR headsets, and phones.

Additionally, KWYN EFECTIVE captures important decision-making themes based on existing resources and past experiences of military medical personnel, and then automatically assesses trainee proficiency against objective performance metrics linked to these skills.

In this scenario, developed in KWYN EFECTIVE, a trainee plays from the perspective of the Incident Commander to allocate resources and assign helper medics to perform tasks on casualties. They also interpret mission requirements to make decisions about patient care.

"KWYN EFECTIVE combines our ability to build these realistic game environments with our ability to understand a complex set of skills from an educational point of view. On top of everything, we apply our 'secret sauce'—we use AI analytics and algorithms to adapt the training to the individual trainee and make sure it delivers maximum learning gains in the minimum time... something that's especially important for those who have to take the training while still performing their jobs."
–Peter Weyhrauch, VP, Human-Centered AI

KWYN™ MASTERY

An adaptive digital flashcard app that integrates with existing courses

KWYN MASTERY helps Marines accelerate learning and improve retention of foundational knowledge. The digital flashcard app provides an adaptive learning engine through a user-friendly interface. It enables instructors to bring principles of intelligent tutoring to their courses so that Marines can quickly and effectively learn essential material.

Machine learning algorithms automate tedious tasks such as creating decks, generating multiple-choice answer options, monitoring students' progress, and adjusting the frequency of card exposure to help students master difficult content. Plus, KWYN MASTERY integrates with the Moodle learning management system used by the Marine Corps and writes data to a Marine Corps learner record store as xAPI statements. As a result, instructors gain insight into student progress and save time by automatically creating flashcards based on existing courses.

This digital flashcard app provides adaptive training based on the principles of learning science to maximize the acquisition and retention of knowledge. As students study the cards in the deck, KWYN MASTERY monitors their progress and adjusts by showing difficult material more often than the material they have mastered. The app helps accelerate students' progress, enabling instructors to teach more advanced material sooner. Consequently, Marines efficiently learn and prepare to protect the nation.

Marine adaptive schoolhouse training with elearning repetition technology

More Efficient Training

At Charles River Analytics, we develop training solutions with high quality and valuable results in mind. We consider user needs and customize solutions to optimize training and make it as efficient as possible. You get evidence-based, intelligent, adaptive training solutions when the KWYN platform supports your training program.

To learn more about how we can work with you, email contactus@cra.com.

charles river analytics

Solutions to serve the warfighter, technology to serve the world.®

Charles River Analytics uniquely combines agile innovation and leading-edge research with a decades-long track record of hardened engineering in austere environments to create best-in-class solutions to diverse, challenging problems.

We were founded in 1983 to perform results-focused research for the US Government. In 2012, we became a 100% employee-owned company, setting the stage for the next generation of innovation, service, and growth.

Decades of government-funded innovation have generated an extraordinary breadth of core IP, which we harness to create an ongoing stream of breakthrough research.

The tools we develop maximize a trainee's transfer of skills through ecological mapping of real-world scenarios to computer generated training scenarios, reducing training equipment, development, execution, and maintenance costs.

Our immersive applications place trainees in gamified environments that are realistically rendered. To optimize training, we measure physiological signals and the cognitive workload of each trainee to create adaptive curriculums tailored to each individual.

ADAPTIVE INTELLIGENT TRAINING

charles river analytics

Charles River Analytics
625 Mount Auburn St.
Cambridge, MA 02138

617.491.3474
contactus@cra.com
www.cra.com

U.S. Prime Contractor

Employee-Owned Small Business