
KWYN®
KNOWS WHAT YOU NEED
ADAPTIVE
MISSION
SUPPORT
& TRAINING
charles river
analytics

KWYN®

KNOWS WHAT YOU NEED

An AI platform for adaptive mission support and training

The world is moving fast, and you need a large workforce of skilled people ready to do their jobs. On the job, the KWYN® AI platform augments skills through intelligent guidance and coaching. During training, KWYN accelerates skill acquisition and retention. The KWYN platform drives the next generation of performance and readiness—our products and yours are faster, smarter, and perfectly optimized for delivery via multiple channels.

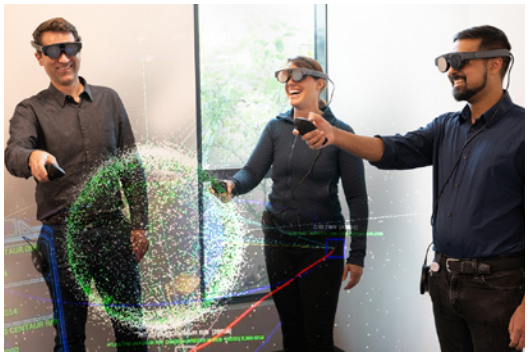
Crucial benefits

- Build and maintain situational understanding
- Continually assess progress
- Provide personalized feedback and guidance to achieve objectives
- Build, maintain, and extend competency throughout training and operations
- Foster continuous feedback and improvement cycles
- Reduce human error, improve decision-making
- Accelerate knowledge acquisition, retention, and application
- Reduce costs, increase return on investment

Key features

- AI for real-time mission support, intelligent help, and customized guidance integrated into operational systems
- Library of AI components for simulation-based training, including performance tracking, real-time assessment, feedback, and after action reviews (AARs)
- Enterprise training support, including automated scheduling, scenario and content generation, talent management, and performance optimization
- Adaptive human behavior agents to drive realistic entities in simulation and training

Backed by 40 years of R&D innovation, we build KWYN technologies with integrity and a focus on continuous improvement.



With adaptive mission support and training, you can improve performance and readiness across your organization while reducing costs.

What is adaptive mission support?

- Enhances individual and team performance and readiness through customized on-the-job guidance and coaching
- Uses overlays, nudges, and customized guidance by integrating the KWYN engine into operational software
- Allows your organization to dynamically improve and extend an individual's or team's skill set to address new challenges

What is adaptive training?

- Tailors itself to each individual's needs and progresses them as quickly as possible along their unique learning path
- Applies scalable AI techniques to make training more effective and efficient
- Empowers both individuals and the organization to deliver peak performance

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 knowledge 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

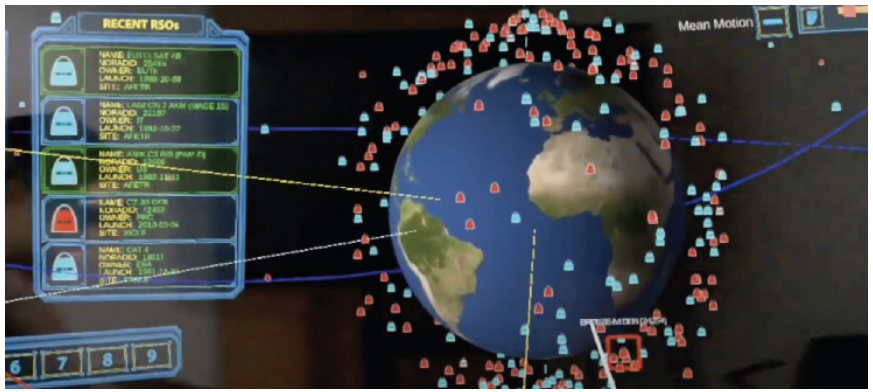
Mr. Guarino added, "KWYN MAGPIE promises to reduce training costs in two ways. First, it provides rapid and intuitive authoring that allows course designers to construct new training content with limited software engineering support. Second, it reduces the cost of training exercises by allowing instructors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

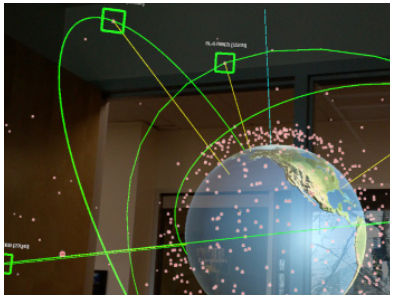
Our ongoing R&D is exploring extending MAGPIE into operational settings for just-in-time coaching.

An immersive environment for rapidly understanding the space domain

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, multidomain concepts that are inherently 4D.



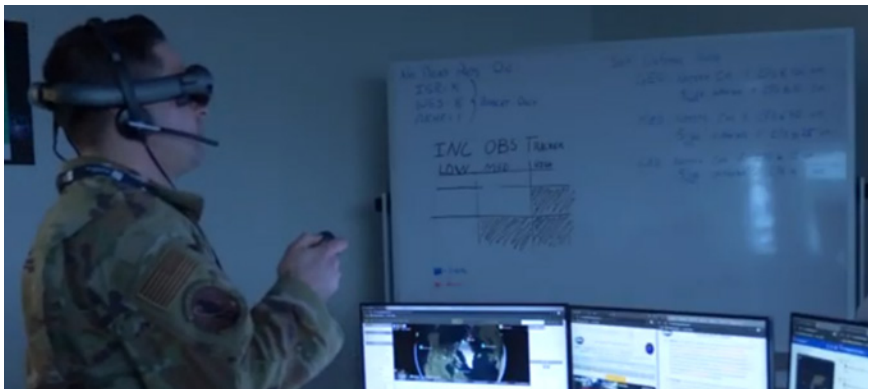


KWYN SOLAR runs with a web-based application across a variety of educational and training environments.

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 collocated 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 commercial off-the-shelf (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, Charles River Analytics

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 flash cards 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

Solutions adapt to you, improving performance, readiness, and efficiency

At Charles River Analytics, we develop high quality adaptive training and on-the-job AI guidance and coaching solutions with powerful and easily measurable results. On the fly, the KWYN AI engine considers user needs and customizes solutions to optimize performance, readiness, and efficiency. With KWYN adaptive mission support, your people get customized help that improves performance and decision-making with reduced supervisory costs. With the KWYN AI engine supporting your training program, your people get evidence-based, intelligent, adaptive training.

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.

Our tools automatically generate training scenarios based on trainee skill level, maximizing skill transfer by ecological mapping of real-world situations, with immersive applications that place trainees in realistically rendered gamified environments.

With our AI engine, the guidance and curriculum adapt to each individual, providing more coaching when they are struggling or optimizing efficiency when they’re not—no need to train on a skill they already know. We can also measure and integrate physiological signals of cognitive workload to tune training and coaching.

ADAPTIVE MISSION SUPPORT & TRAINING

KWYN®

KNOWS WHAT YOU NEED

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

Published: 13 December 2024