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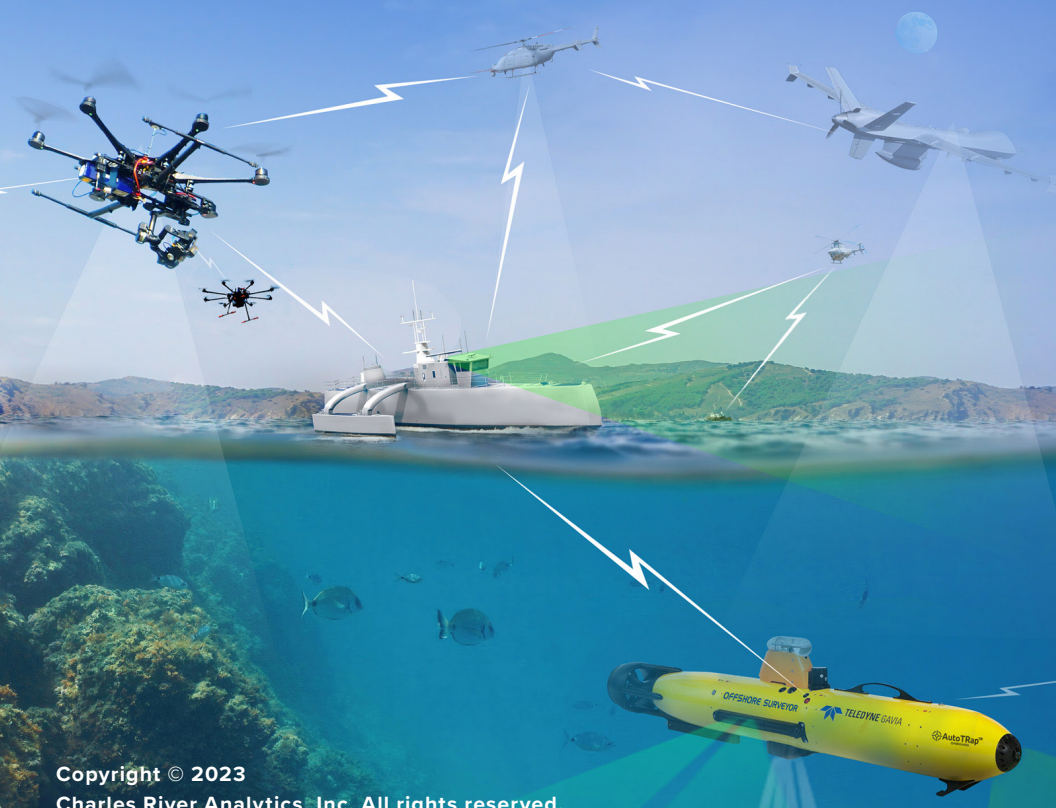
AUTONOMY YOU CAN TRUST



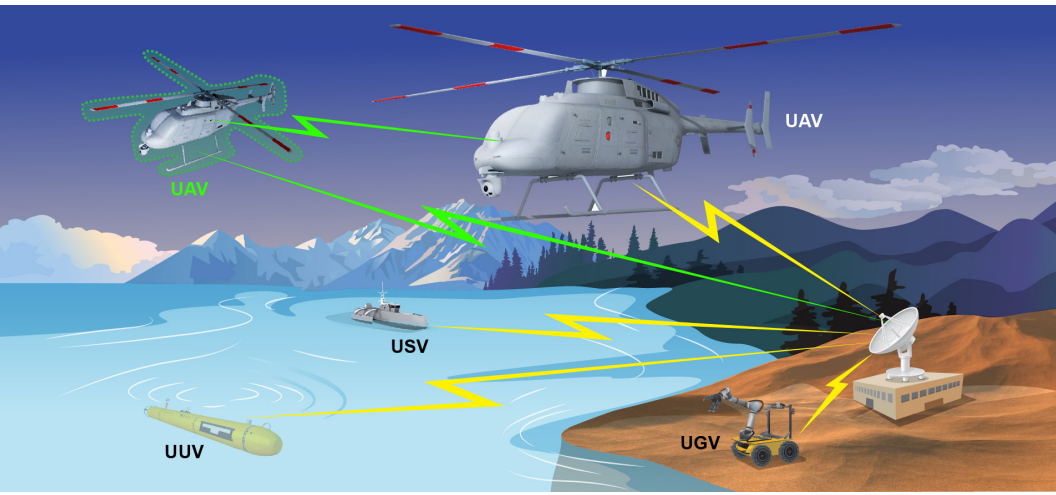
AUTONOMY YOU CAN TRUST

True, trusted autonomous systems require solving a multitude of interrelated problems. So we've built our expertise from the ground up, developing proof-of-concept demonstrations, highly capable prototypes, and innovative products for a wide range of autonomous applications.

We push the limits of autonomy by developing solutions that work in unpredictable, low-bandwidth environments. We transform human-in-the-loop systems to on-the-loop control and move single vehicle operations to heterogeneous swarms that can act and reason faster than intuition alone.

We integrate this diverse work into autonomy frameworks guided by a simple idea:

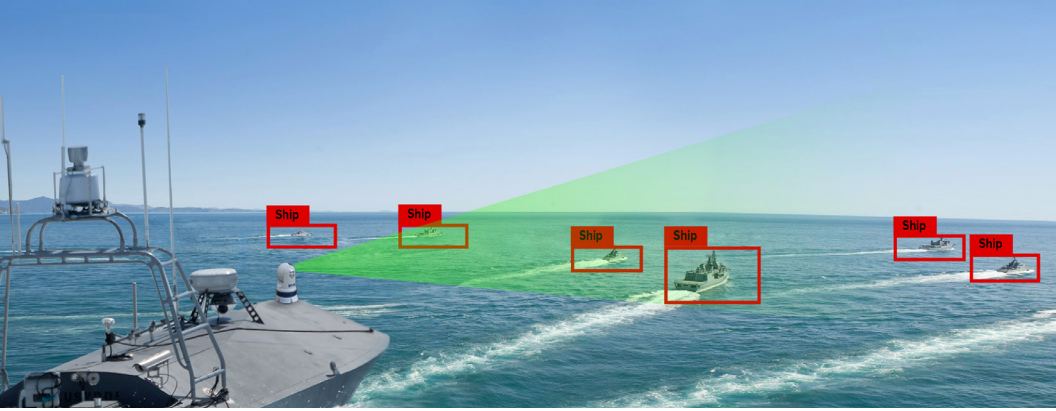
True autonomy will only be adopted when it can earn our trust.



Charles River Analytics is a pioneer in autonomy-enabling technologies, leveraging our 40-year history in advanced AI/ML R&D to develop today's leading-edge adaptive and collaborative autonomy products and prototypes. Whether you're an end user or an industry partner, come talk to us about your most challenging needs!

Our leading-edge collaborative and adaptive autonomy technologies turn uncrewed vehicles into trusted members of your human-machine team on the ground, at sea, in the air, and in space.

Our scientists and engineers combine their expertise in explainable AI, machine learning, neural networks, and computer vision to build a unified framework for future autonomous systems.

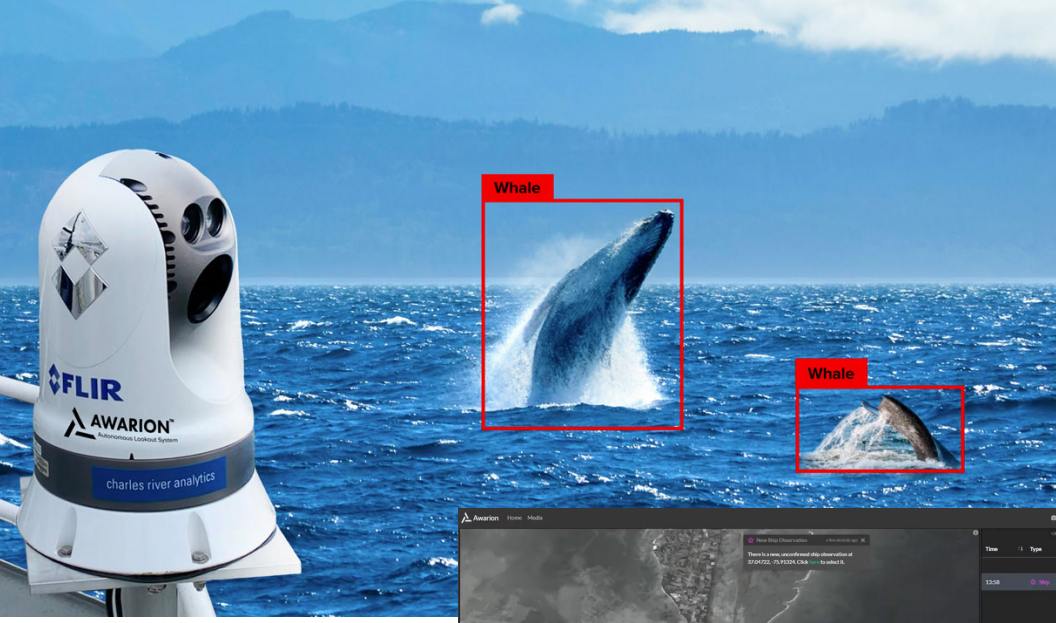


PERCEIVING WHAT'S OUT THERE

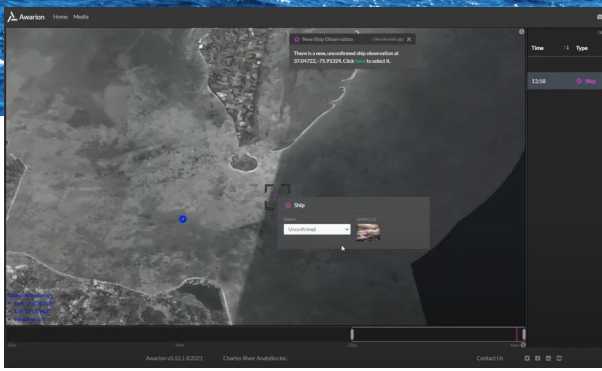
Situational awareness

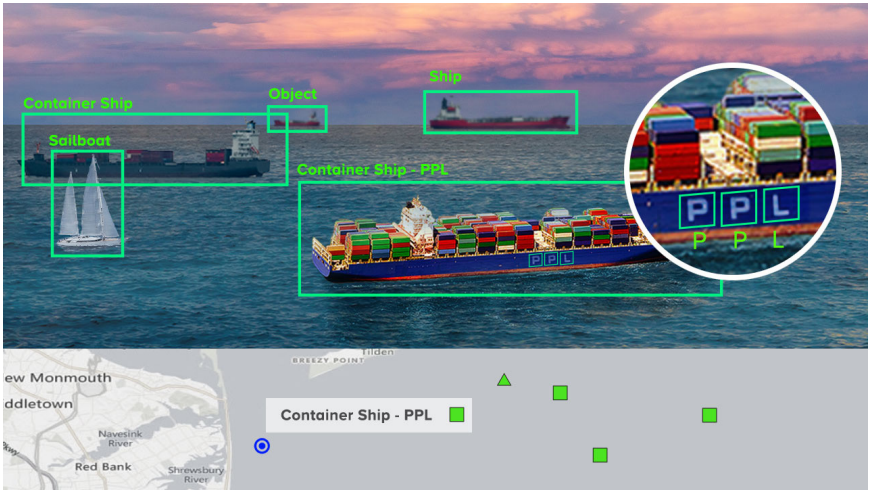
The Awarion™ Autonomous Lookout System detects and classifies ships, obstacles, and marine mammals for automated, real-time decision making at sea or in crowded harbors. Underwater, AutoTRap Onboard® automatically detects and classifies objects of interest in real time.

In all domains, our detection, tracking, and passive ranging technology provides persistent 360-degree awareness, and our AI and machine learning systems identify and assess threats—all while preventing autonomous vehicles from injuring anyone on their human-machine teams.



The Awarion™ Autonomous Lookout System is an AI and computer vision system that complements and supports human lookouts and marine radar systems in detecting whales, ships, and other objects.





We have extended Awarion's detection capabilities into a new product that recognizes and reads text on ships, assisting with surveillance activities and identifying threats.

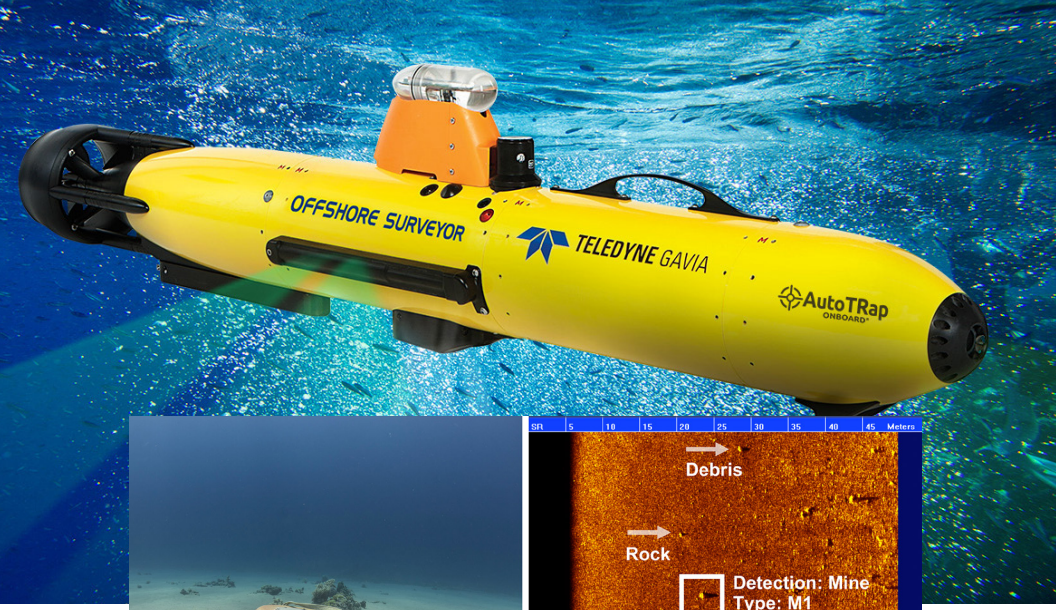
GETTING THERE

Autonomous, adaptive navigation

With our onboard AI, an autonomous harbor vessel adapts its course and behaviors in response to its environment and potential threats to safely complete its mission. Behaviors are based on COLREGs and an in-depth analysis of expert harbor pilot decision making. In one test, integrating our autonomous behavior code shortened routes, increased standoff, and reduced near misses to zero.

Our dynamic routing and autonomous path planning, coupled with 3D perception and image-processing algorithms, power autonomous vehicle teams to navigate treacherous and cluttered environments to detect and classify marine life, navigate disaster areas, and localize nuclear threats in public spaces.

Our other capabilities can turn any kayak into an autonomous vehicle, allow a vehicle to self-geolocate, modify routes based on damage or fuel status, and navigate thermoclines to avoid comms disruptions.



AutoTRap Onboard® empowers your autonomous underwater vehicle (AUV) to act on real-time sonar data to detect objects on the seafloor. The app then provides contact alerts to your system and allows your AUV to investigate further on its own—there's no need to surface, review data, and re-deploy it with a new mission.

Our onboard AI technology powers an uncrewed vessel to adapt its covertness mode based on current conditions.

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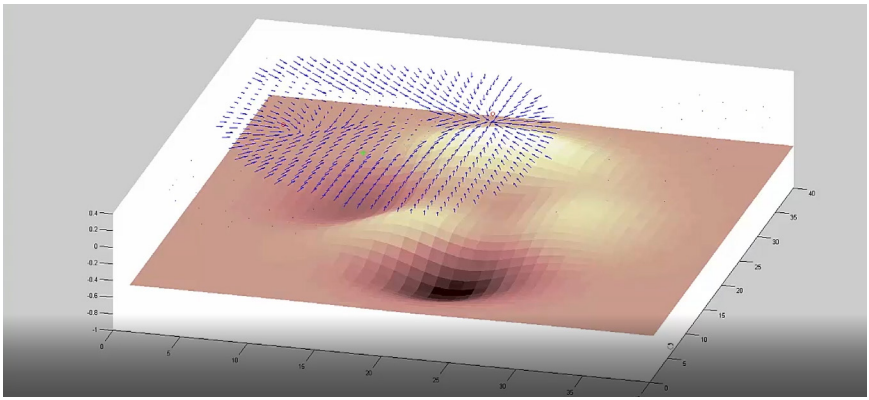
ADAPTING TO CHANGES IN THE ENVIRONMENT

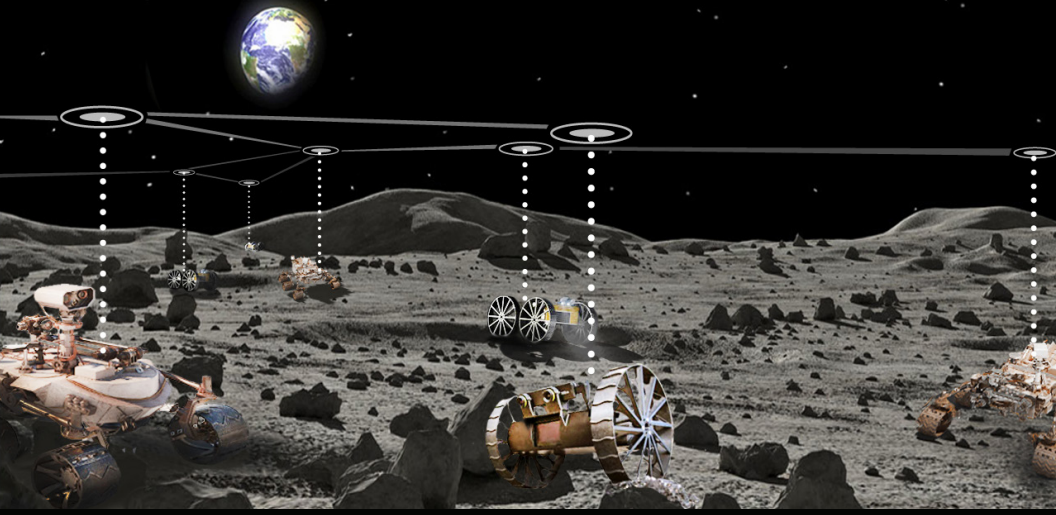
Adaptive autonomy

Our onboard AI uses sensors and models to adapt tactics to ensure mission completion. Machine learning and probabilistic modeling make any software adaptable—allowing it to understand, learn, and adapt to changes in the environment and in the health and status of the uncrewed vehicle.

We use a bio-inspired approach to large swarm control, with deep learning so the swarm can discover and learn the most effective tactics for urban and other complex settings.



Our deep learning, bio-inspired approach allows swarms to discover and learn tactics unique to their environment.



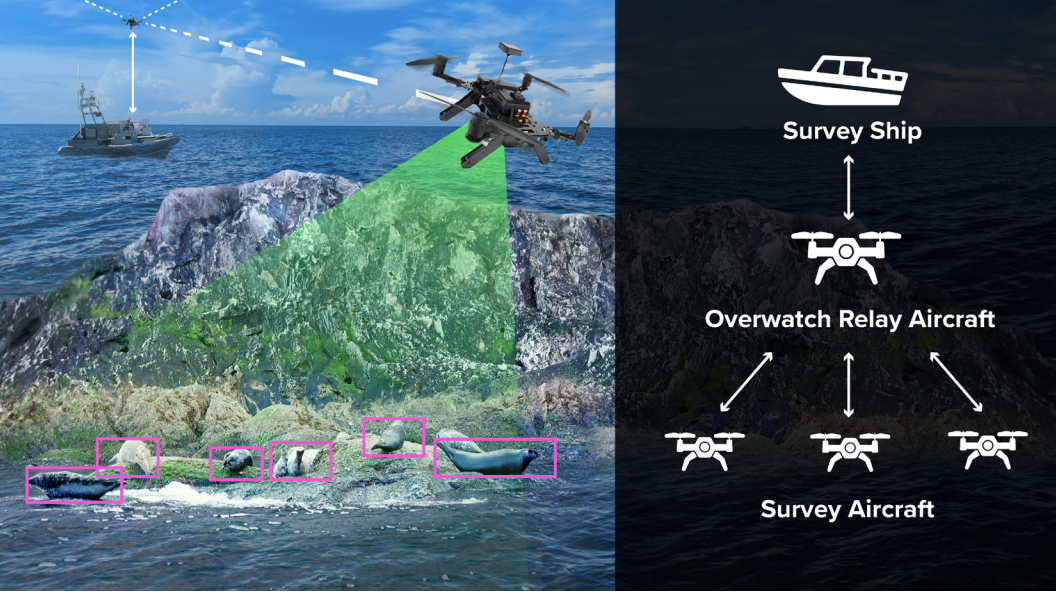
COLLABORATING AND COMMUNICATING WITH THE TEAM

Collaborative autonomy

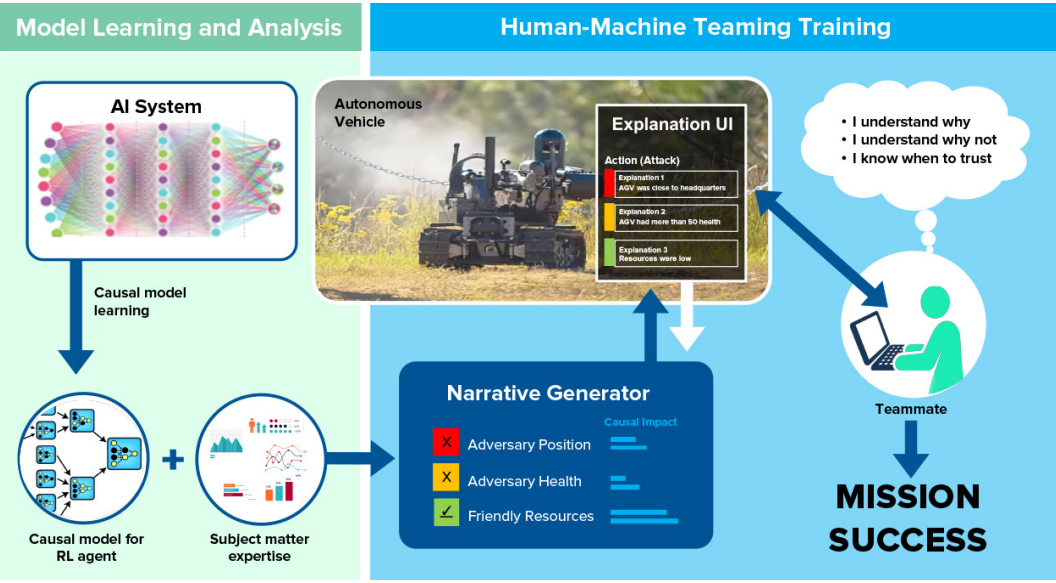
We use probabilistic causal modeling techniques that generate simple explanations of how complex, deep learning machines work, helping humans develop trust in autonomy.

Our gesture and natural language mixed-reality interface provides a natural feel to directing air and ground robot teams.

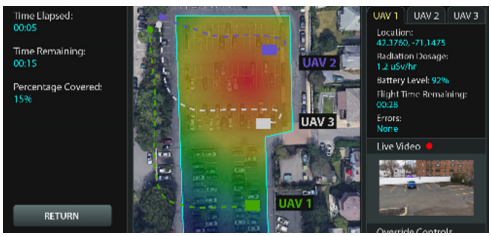
With our collaborative and adaptive autonomous swarm software, teams of robots can remove the injured from harm, classify marine life, and explore the moon, dividing tasks amongst themselves while anticipating and working around damage encountered by their robotic teammates.



Our algorithms power UAS swarms used by scientists to conduct semi-autonomous wildlife surveys.



Our systems are advancing the field of explainable AI. Deep reinforcement learning (RL) techniques and causal modeling allow human-machine teams to successfully complete their missions.



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Charles River Analytics specializes in using leading-edge R&D to solve our clients' toughest, most complex problems. Our wide range of robotic subsystems and autonomy components are designed to seamlessly integrate with current and evolving platforms.

Our deep understanding of applied robotics and autonomous systems is the result of extensive research, development, and deployment across many disciplines, such as AI, machine learning, cognitive science, and human factors. This understanding uniquely positions us to provide mature solutions tailored to our customers' needs.

By integrating our reliable, adaptable robotic subsystems with existing solutions, our customers and their end users can achieve mission-level autonomy for single and multiplatform systems.

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