SYNCITY

SIMULATING THE WORLD

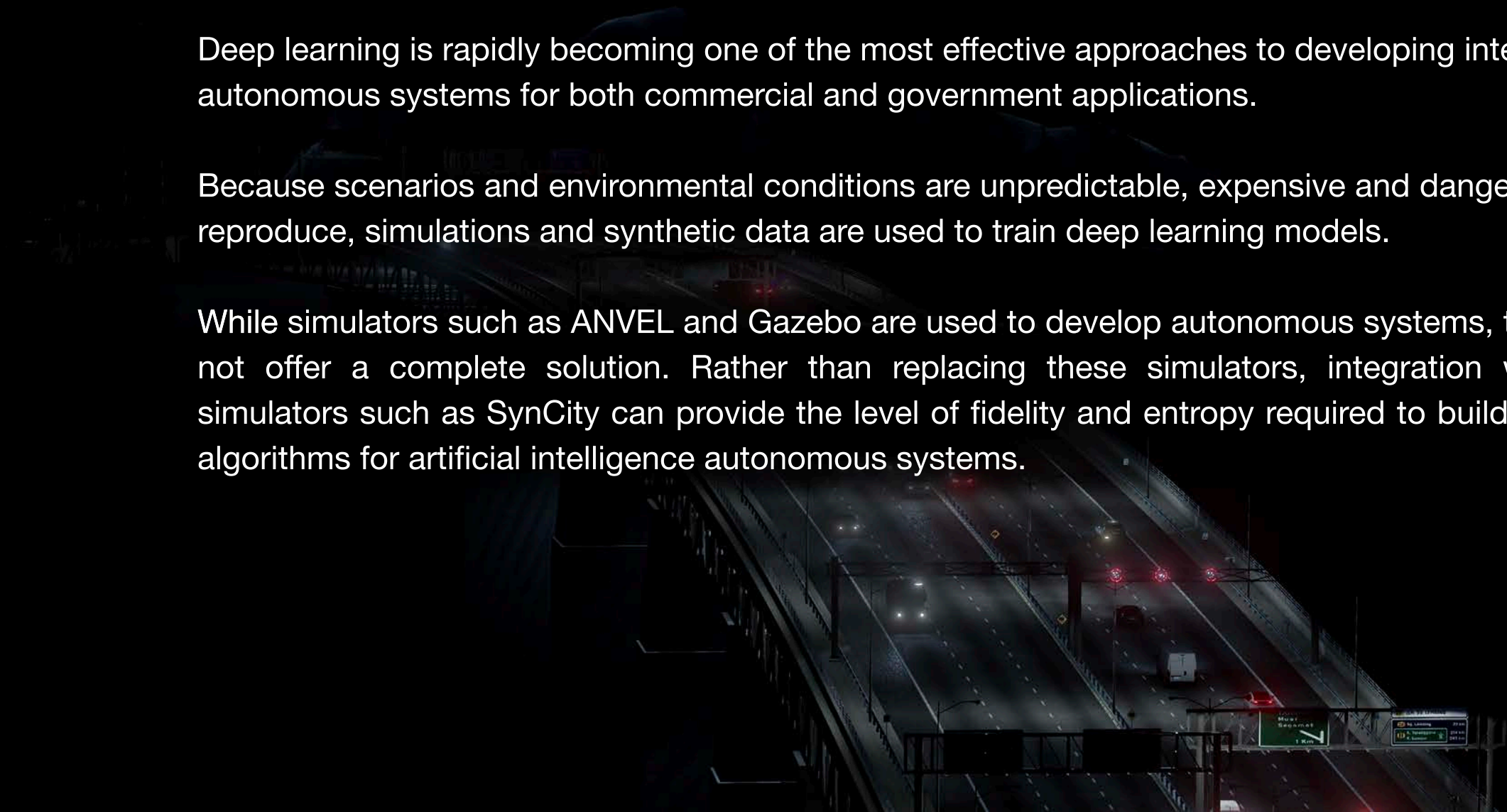
FOR AUTONOMOUS APPLICATIONS

INTRODUCTION - DEEP LEARNING, MODELLING AND SIMULATIONS

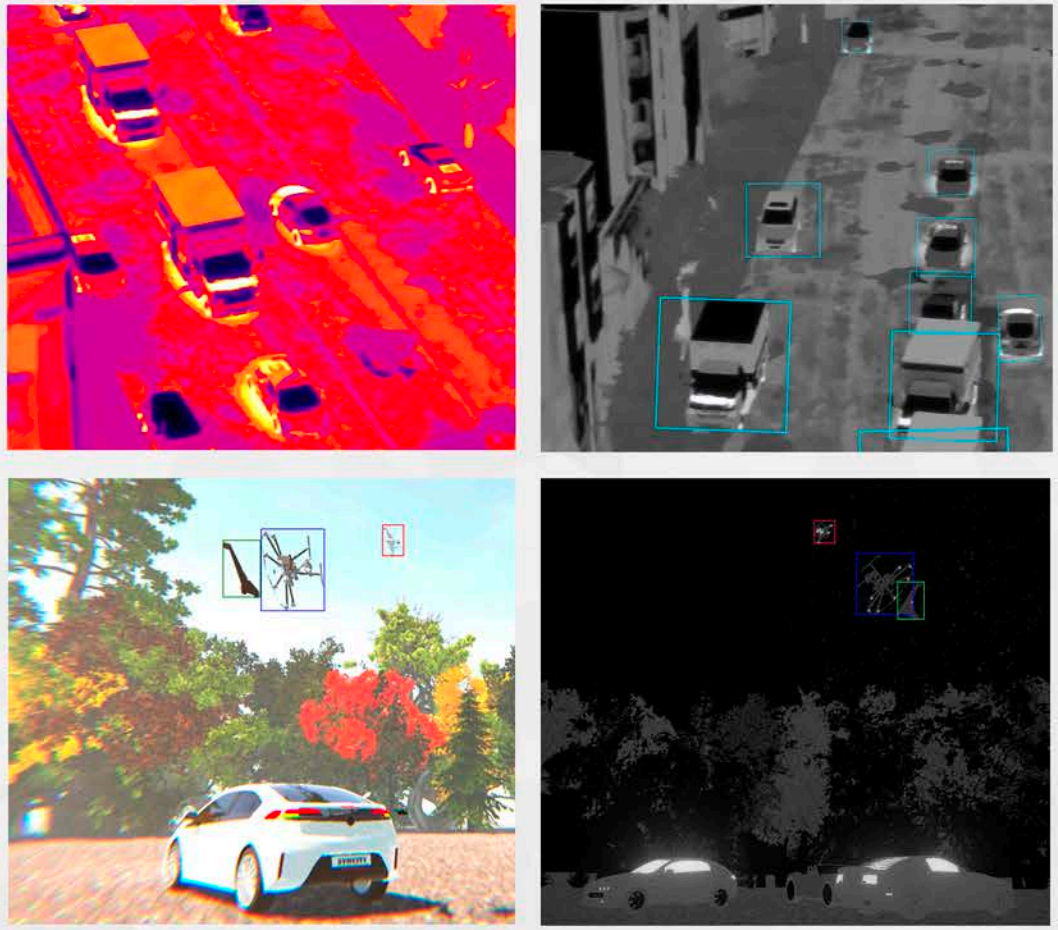
Deep learning is rapidly becoming one of the most effective approaches to developing intelligent, autonomous systems for both commercial and government applications.

Because scenarios and environmental conditions are unpredictable, expensive and dangerous to reproduce, simulations and synthetic data are used to train deep learning models.

While simulators such as ANVEL and Gazebo are used to develop autonomous systems, they do not offer a complete solution. Rather than replacing these simulators, integration with AI simulators such as SynCity can provide the level of fidelity and entropy required to build robust algorithms for artificial intelligence autonomous systems.



SYNCITY - ROBUST SIMULATOR THAT CREATES MEANINGFUL TEST ENVIRONMENTS



Using a state-of-the art gaming engine, we create land, marine and aerial representations of real or fictitious environments. In parallel, we simulate sensor data for LiDAR, radar, near and far infrared, thermal cameras, RGB cameras, and IMU/GPS devices.

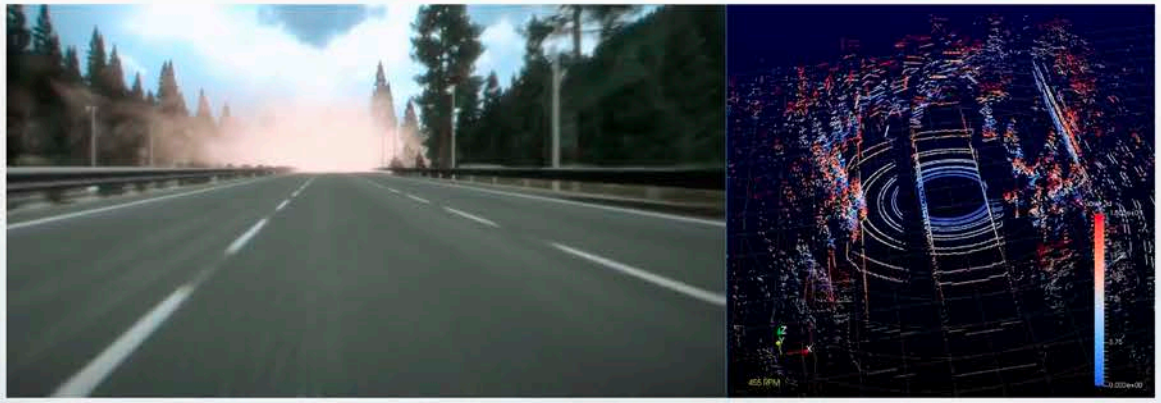
The synthetic datasets generated on SynCity are robust enough to train neural networks and verify artificial intelligence algorithms for a wide variety of autonomous systems.

SYNCITY - TEST AND EVALUATION PLATFORM

SynCity is a new technology that can be used as a developmental and operational test and evaluation platform, assisting with certifying sensor and/or unmanned systems at any stage of development. This could help remedy some of the operational challenges associated with unmanned systems.

SynCity optimizes operational experience. Lessons in the field can be replicated. Environments can be reconstructed. Sensor degradation can be simulated in real-time for the purpose of upgrading existing systems and/or influencing the designs of future ones.

SYNCITY - SENSOR DEGRADATION AND VERIFICATION

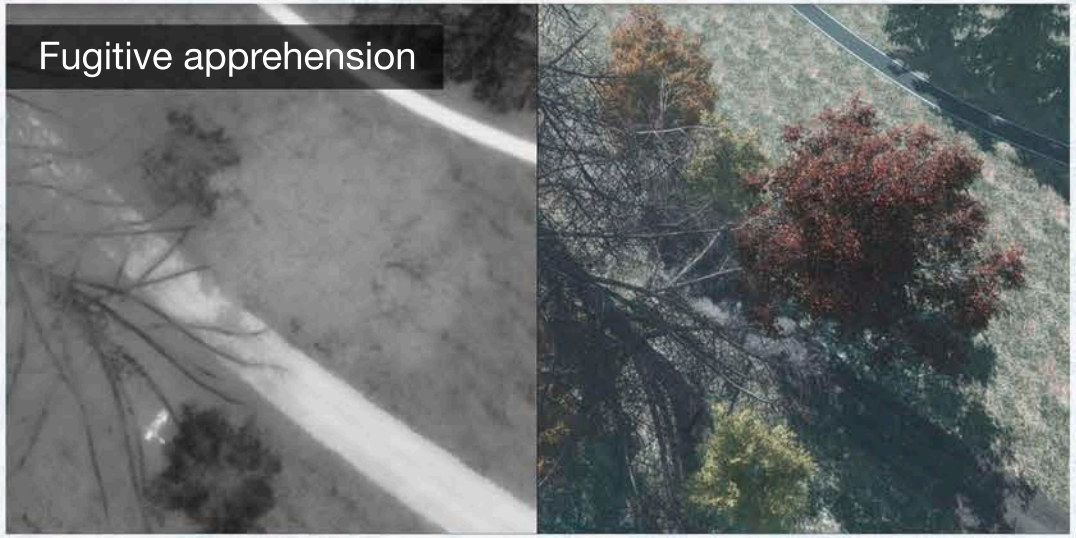


UGVs depend on range sensors, such as LIDAR, stereo-vision and the RGB-R sensors for navigation. These sensors are susceptible to environmental effects such as changes in lighting and the presence of dust, smoke or fog.

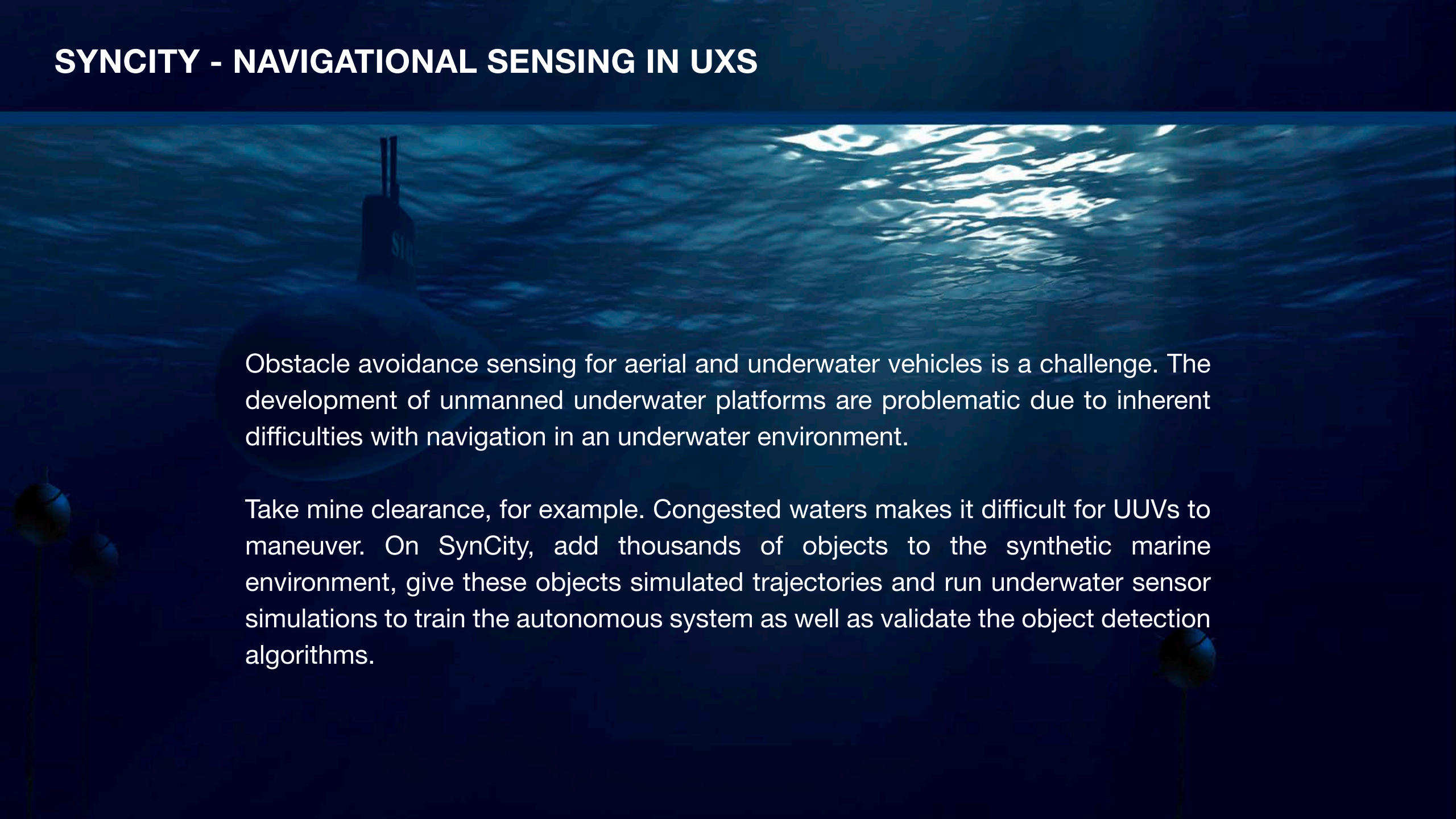
Imagine an autonomous truck convoy driving through an area. Dust and sand is produced from the first truck, which acts like an impenetrable wall disabling the LiDAR devices. Dependence on other sensors, in this case radar, increases. On SynCity, sensor fusion simulations test and verify the sensor algorithms and the operability of the UxS in harsh weather/lighting conditions to ensure that the convoy reaches its destination without incurring damage to the vehicles.

SYNCITY - SENSOR SIMULATIONS FOR PUBLIC SAFETY OPERATIONS

Capturing real world training data to train autonomous systems for public safety operations has its challenges. On SynCity, thermal and RGB camera sensors can be simulated. Synthetic, accurate thermal signatures can be generated for search and rescue, situational awareness, fugitive apprehension, traffic investigation, and operational safety in real time.



SYNCITY - NAVIGATIONAL SENSING IN UXS



Obstacle avoidance sensing for aerial and underwater vehicles is a challenge. The development of unmanned underwater platforms are problematic due to inherent difficulties with navigation in an underwater environment.

Take mine clearance, for example. Congested waters makes it difficult for UUVs to maneuver. On SynCity, add thousands of objects to the synthetic marine environment, give these objects simulated trajectories and run underwater sensor simulations to train the autonomous system as well as validate the object detection algorithms.

SYNCITY - MAKING AUTONOMOUS SYSTEMS SAFER

The synthetic data generated on our platform is currently being used to train neural networks for a wide variety of applications in law enforcement, security, transportation and agriculture.

We designed SynCity specifically for deep learning. A hyper realistic simulator that generates the exact kind of training data needed to develop and deploy autonomous applications.

MAKING AUTONOMOUS SYSTEMS SAFER

Contact us for more information:

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