



## SOR Licenses CSIRO Technology for Robotic Security Teams

Western Australia - November 12th 2020 - Strategic Elements Ltd (ASX:SOR) subsidiary Stealth Technologies has licensed **world leading CSIRO technology** that enables **robots to work together in teams**. The parties will initially focus on **security** applications and work under an Early Adopter Program (EAP) that will assist Stealth to integrate and commercialise the technology.

The Wildcat SLAM technology leverages more than **ten years** of research and development at CSIRO's Data61, the digital specialist arm of Australia's national science agency. Wildcat enables autonomous robots to simultaneously navigate and build high-definition maps, and gather other sensor data in locations they are being exposed to for the first time (ie: with no pre-existing maps). In addition, robots can **automatically share and combine information** with other robots without human intervention to build a collective understanding of their global environment.

Wildcat is a key enabling technology in 'robot perception', a system that endows the robot with the ability to perceive, comprehend and reason about the surrounding environment. When one robot encounters an obstacle or new context and learns, the entire team of robots **can instantaneously learn**. Wildcat also works underground and in GPS-denied environments.

### Stealth Autonomous Security Solutions

Stealth Technologies is developing the Autonomous Security Vehicle (**ASV**) for perimeter security in sectors such as transport, energy, defence, government and utilities providing critical services. The Global Perimeter Security Market is forecast to be reach **USD 282.26 Billion by 2025**<sup>1</sup>.

The Company is also exclusively collaborating with giant **US Fortune 100 Company Honeywell**<sup>2</sup> to build autonomous security vehicles for the correctional justice sector. The parties are currently working with the **WA Department of Justice** to build a fully autonomous and robotic security vehicle for the Eastern Goldfields Regional Prison in Kalgoorlie to inspect, test and confirm the integrity of the secure perimeter.

The CSIRO's Data61 technology can provide Stealth with a key technological advantage in enabling its ASV's to work in teams and provide **enhanced security and surveillance solutions** to its customers. Stealth also recently formed a collaboration with leading US based Company Planck AeroSystems to enable drones to launch and land from its ground based ASV.

### Wildcat SLAM

Deploying teams of robots often requires them to operate reliably in unstructured and dynamically changing environments, **where there are no external positioning systems** such as GPS, or pre-existing localisation maps. In these environments, robots must use their on-board sensors and perception algorithms to simultaneously build detailed maps of the world whilst determining their location at the same time. This technology is referred to as SLAM, or Simultaneous Localisation and Mapping. Whilst there are many approaches, and a few commercially available solutions, **none of them** are sufficiently robust or accurate without GPS, nor directly support the operation of robot teams through map sharing and cooperative localisation.

Wildcat is the world's most versatile, robust and accurate SLAM solution. It won the **most accurate** object detection **prize** in the global DARPA robotics competition for underground exploration and mapping by robot teams, where CSIRO competed against the **best field robotics groups in the world** in GPS-denied environments.

**SOR Managing Director Charles Murphy said:** *"The Wildcat SLAM technology can potentially provide game changing features to our autonomous robotics platform. This could be where for example large scale facilities require multiple ground based security vehicles, facilities where ground plus airborne based autonomous security provides enhanced benefits, facilities that have poor coverage of satellite signal for GPS or in new applications for defence. Wildcat fits directly with the technology roadmap we are developing for our next generation Autonomous Security Solutions using teams of robots for enhanced patrol and surveillance capabilities.*

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## Early Adopter Program

Wildcat has been designed as a research and development **platform** for autonomous field robots and a **commercially ready solution** for industrial applications. Stealth will incorporate the Wildcat technology into its ASV research and development program and investigate the potential to provide team based autonomous mapping and navigation **commercial solutions for security applications**. Features will be progressively implemented into the Stealth AxV Autonomous Robotics Platform over the next several quarters.

- The term of the EAP is 12 months. During the EAP the license is non-exclusive and global. No consideration will be paid up front by Stealth Technologies.
- Stealth may sell products and solutions to distributors or end users that contain the Wildcat technology during the term of the EAP.
- Commercial gains received by Stealth Technologies from utilisation of the Wildcat technology during the EAP will attract a fee to be paid to CSIRO.
- After 12 months it is intended that the EAP will cease and the parties may choose to transition this arrangement to a full commercial licence.
- Stealth will receive access to new Wildcat Technology features released by CSIRO during the EAP.
- CSIRO will provide basic integration support, training and ongoing support for data processing and de-bugging. Additional ongoing support will be negotiated between the parties.
- Stealth will share data with CSIRO to assist further development of the Wildcat Technology.

## Wildcat Background

The Robotics and Autonomous Systems Group within CSIRO's Data61 have built a world-wide reputation for pioneering the development of extremely accurate and robust 3D LiDAR-based SLAM solutions since 2008. Wildcat builds on more than a decade of experience to provide a new benchmark in accuracy, robustness and processing speed, and is optimized for robotics applications. Wildcat was purpose-built for multi-robot coordinated mapping and allows the maps from multiple sources to be merged in real-time during capture to produce a unified, globally optimised dataset and map.

## The AxV Autonomous Robotics Platform

Although the first release is in the form of the ASV for security, the underlying AxV technology platform is scalable to a **range of vehicle shapes and sizes** and custom robotics are **adaptable** to perform a variety of physical actions and tasks. Further releases from the platform could be deployed for industries such as **mining, agriculture and logistics**.



### 1. Autonomous Perimeter Security Patrol & Surveillance

- o 24\*7 365 Day Operational Capability - Day and Night Vision
- o Collision Avoidance System
- o Autonomous Navigation Between Map Points
- o Emergency Braking System
- o Imposing Physical Presence

### 2. Autonomous Perimeter Intrusion Detection System Testing

- o Perimeter fence sensor testing - Microphonic and Fibre Optic (Purpose Built Robotic Actuators)
- o Microwave sensor testing
- o Photo electric sensor testing (PE)
- o Electro magnetic sensor testing (EM)

### 3. On Board Surveillance Features

- o Autonomous Object Tracking System
- o Incident Alert Lighting
- o Live Military Grade Video Feed
- o High Definition 30x Camera Zoom
- o Day and Night Vision Surveillance Distance: 400m
- o Two-Way Intercom

### 4. System Integration

- o Fully Integrated Into Honeywell's EBI Platform (DVM)
- o Capable of Operating within Secure Isolated Networks
- o Capable of Advanced Computer Vision - Facial and Number Plate Recognition

## Stealth Autonomous Security Vehicle

## Strategic Elements

The Australian Federal Government has registered Strategic Elements as a Pooled Development Fund which enables most shareholders to pay no tax on capital gains or dividends. Strategic Elements operates as a 'venture builder' where it generates ventures and projects from combining teams of leading scientists or innovators in the technology or resources sectors. The Company is listed on the ASX under the code "SOR". More information on the Pooled Development Program should be read on the Company's website. For Company Information: Mr Charles Murphy, Managing Director Phone: +61 8 9278 2788 [admin@strategicelements.com.au](mailto:admin@strategicelements.com.au) [www.strategicelements.com.au](http://www.strategicelements.com.au)

*This announcement was authorised for release by Strategic Elements' Board of Directors.*

<sup>1</sup><https://dataintel.com/report/perimeter-security-market/> <sup>2</sup>Announced to the ASX on 16/10/2020