



DEPARTMENT OF BUSINESS AND INNOVATION

# Agent Oriented Software (AOS)



Victoria has a strong defence capability enhanced by a skilled workforce and supportive government. Agent Oriented Software provides leading-edge software applications for the new frontier in defence, aerospace, motor vehicle and agricultural equipment technology: autonomous systems.

Agent Oriented Software (AOS) Group specialises in software products with decision-making capabilities that allow them to sense and respond to environmental change, anticipate future goals and work in teams, just like humans do.

What started off as a one-man band running out of an office at Melbourne University has grown into the world's leading developer of autonomous systems software.

Since its humble beginnings in 1997, AOS has successfully launched its niche software products in the US, UK and European markets, and now has offices in the Chicago and Cambridge as well as in Elizabeth Street in Melbourne's CBD.

The autonomous systems software is the result of continuous research and development which began – before AOS was even established – with research in the late 1980s into autonomous fault diagnosis for the Space Shuttle.

This software is unique, making AOS' main competitor itself – even so, the company is constantly working with universities to research new technology to ensure it remains at the forefront of the market. AOS works with the UK Civil Aviation Authority to determine standards to test its software against – this testing can be done in a number of ways, such as through simulation, flight trials or software verification testing.

AOS' first major customer was Australia's Defence Science and Technology Organisation (DSTO) and its first product, named JACK®, has been used for military and academic research since 1998.

The company now services a combination of civil and defence customers, ranging from the world's largest offshore oil operator and major aerospace companies to the UK and US defence departments. Its software applications range from oil production decision support, surveillance and air traffic management to autonomous air and underwater vehicles and advanced military simulation systems. AOS is also directly approaching companies in the road transport industry to explore how they can use its products.



Dr Andrew Lucas, CEO Agent Oriented Software



DEPARTMENT OF BUSINESS AND INNOVATION

Chief Executive Officer Dr Andrew Lucas says the defence sector presents the most exciting opportunities. "The defence sector is generally very comfortable with taking on high-risk technologies and proving they work," observes Andrew.

AOS products are used by the defence sector in many ways: they can be deployed on board an autonomous vehicle or as part of an IT system. They can simulate pilot behaviour in flying tests, or put soldiers in a virtual warzone to assess how they respond to fear, fatigue and so on.

They can also test the effectiveness of equipment in virtual environments. "We're currently working with DSTO to develop a new simulator for submarines," says Andrew.

**AOS' JACK software is the world's leading autonomous systems development platform. A common application is the simulation of armed conflict scenarios for military training, creating a virtual battlefield with intelligent virtual soldiers that not only follow the military tactics of real soldiers, but also display human reactions that can affect decision making.**

Andrew says the company's latest product, CoJACK, brings the same concept to the world of video games.

"Using CoJACK, computer games feature intelligent virtual actors that react to things like fatigue, the affects of caffeine and the way they perceive their environment. They show emotions such as fear, which make them behave in a more human-like way," he says.

"CoJACK is currently being used by the British defence industry for counter terrorism training. The US is also looking into using it to train security personnel to detect suicide bombers – it can help them learn the behaviours associated with terrorism activities."

Maintaining a high profile overseas is important to the business. Recent support from the Victorian Government ensured AOS was represented at the 2010 Farnborough International Airshow in Britain, with the government providing funding and also assistance in arranging meetings and media opportunities.

"We've exhibited at the Farnborough Airshow since 2002 as it's an effective way to market our software," says Andrew. "It's vital that we retain our presence at these types of major international trade shows, so the Victorian Government's support was much appreciated."

While Andrew feels AOS' success is due to single-mindedness and determination, he says its best asset is its strong relationships with international major partners, such as Rolls-Royce, Boeing, Lockheed Martin, BAE Systems and Thales. It also has collaborative partnerships with Cambridge University's Institute for Manufacturing and York University's High Integrity Systems Engineering Group.

But the company's focus is not only overseas – back home it has established partnerships with DSTO and also with local universities.

"Being based in Victoria provides great academic opportunities for us. We've got strong partnerships with the University of Melbourne and RMIT around collaborative research on agent systems, and we've also so far funded nine doctoral research students at RMIT and Melbourne universities," Andrew explains.

"On the flip side, we're providing great research and employment opportunities for some very smart and talented locals."

