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Raytheon supports pioneering systems research

CANBERRA – 3 September 2008: Pioneering Australian research into a method of distilling huge amounts of information about large scale, high risk engineering projects into small, easy to understand segments, can eliminate cost blow-outs and schedule overruns, saving hundreds of millions of dollars.

Raytheon Australia Project Manager, Jim Boston, told the Software and Systems Engineering Process Group (SEPG) Conference in Melbourne recently that the method, known as Behavior Tree, had already been trialled by the company when analysing six large scale, nationally critical projects for the Australian Defence Force.

It had immediately uncovered a number of major issues with the systems, at a significant saving in cost and time compared to conventional processes.

Raytheon Australia is providing financial support and partnering for world leading research by Griffith University to develop the Behavior Tree.

Mr Boston said modern engineering projects often consisted of thousands of separate pieces of information which describe how a system or situation works. The amount of detail and sheer volume of information, particularly with high risk projects, was far too large for the human memory to digest. This prevented anyone from gaining a deep, accurate and holistic understanding of how a system or situation works, potentially leading to costly delays or failures.

“Our natural language also contains ambiguities and inconsistencies which further inhibit a complete understanding of the whole process and have an adverse impact on the development of the solution,” he said.

Professor Geoff Dromey, Doctor Dan Powell and the team at the Australian Research Council Centre for Complex Systems at Griffith University developed Behavior Trees, a method of distilling large amounts of detail into bite-sized chunks.

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The Behavior Tree represents small fragments of behaviour using rigorously translated, unambiguous words to describe each part of a complex system, like a jig-saw piece.

The pieces are then put into their proper place to give a complete tree-like picture, showing the integrated behaviour of the system, and making it easier to comprehend. This also identifies defects in the system -- pieces which are missing or do not fit.

Professor Dromey has estimated Behavior Trees could save hundreds of millions of dollars in Australia alone.

Mr Boston said Raytheon now wants to see this method further developed in areas of critical interest to the company and the Defence Industry.

“This research is fundamental to the ongoing development of robust and dependable solutions for Defence and industry in general. It has the potential to further promote Australia as a leader in both Systems Engineering and Engineering development from requirements through to solution,” he said.

As the result of this collaboration, Raytheon Australia received the award for Best Industry Experience Report at the 19th Annual Software Engineering Conference (2008).

Professor Dromey was recognised in the inaugural Australia Research Council (ARC) Outcomes forum in June 2008 which celebrates real-world outcomes from world class research as judged by ARC peers.

For more information about Behavior Trees go to www.behaviorengineering.org

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With facilities located across the country, Raytheon Australia is a highly capable prime contractor with an engineering and technical workforce of 1300 backed by world-class management and quality systems. This local presence is bolstered by strong relationships with small and medium sized enterprises and access to the global resources of Raytheon Company.

Raytheon Company, with 2007 sales of \$21.3 billion, is a technology leader specialising in defence, homeland security and other government markets throughout the world. With a history of innovation spanning 86 years, Raytheon provides state-of-the-art electronics, mission systems integration and other capabilities in the areas of sensing; effects; and command, control, communications and intelligence systems, as well as a broad range of mission support services. With headquarters in Waltham, Mass., Raytheon employs 72,000 people worldwide.

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