Virtual predictions beat destruction

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(PhysOrg.com) -- Before computer modelling there was only one way to discover the limits of a metal alloy, or any other material – test it to destruction. The problems with this approach are obvious: it's expensive, wastes resources and takes time.

Therefore it's not surprising that 'virtual manufacturing' at the Swinburne-based Australian Advanced Manufacturing Research Centre (AusAMRC) is attracting the attention of major industrial companies looking for solutions to complex technical issues.

Headed by Professor Jeong Yoon, the Swinburne virtual manufacturing team offers Australian manufacturers access to cutting-edge engineering and technology capabilities.

"What we do is simulate the manufacturing process using computer-aided engineering to predict outcomes in the physical process," Professor Yoon said. "Our work helps a manufacturer design components and achieve the best results from the materials being used."

Companies using the computer simulation skills of Professor Yoon include Boeing – where the focus is on composite materials such as those used in the 787 Dreamliner ordered by Qantas – and aviation suppliers such as Sandvik Australia and Lovitt Technologies.

"What we bring to a manufacturer is a combination of cost and time saving. If the behaviour of a material is not well known, it can take a long time to accurately assess its properties and the point at which it

fails," Professor Yoon saId.

"For example, in automotive design, a manufacturer must know how materials will perform in a crash. We can do most of the essential early analysis using our computer-modelling techniques."

AusAMRC industrial liaison Miro Miletic says the work of Professor Yoon is attracting widespread interest in the manufacturing sector.

"Companies are beginning to appreciate what early stage computer-aided modelling can do for the predictability of their products, not just in terms of saving time and money, but in achieving a better finished product," Mr Miletic said.

AusAMRC, which opened in November 2009, is modelled on a successful research centre established with Boeing at the University of Sheffield in the UK. It is part of a network of collaborating Boeing-engaged research centres around the world.

Boeing Research & Technology-Australia coordinates the work of AusAMRC, with the primary aim of helping suppliers to Boeing improve their capabilities and deliver globally competitive products.

Research projects are funded by membership fees, and through partnerships with other research organisations and state and federal government.

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