

News Release

Young engineers unveil new work to further aerospace industry

Finalists compete for prestigious prize in West of England

17 April 2009

Young engineers will reveal new research which aims to reduce costs, environmental impact and time scale of developments within the aerospace industry – in the hope of winning the prestigious Western Aerospace Centre (WAC) Prize 2009. On **20 April at the University of Bristol**, the four finalists will present their findings to a panel of leading aerospace organisations in the West of England.

Organised by the Institution of Mechanical Engineers' (IMechE) Western Aerospace Centre (part of the Aerospace Industries Division), a record number of young engineers from both universities and industry entered the competition this year. Although the award takes place annually, the competition format has been re-vamped to be more in line with industry practices, ensuring a wider range of entries.

Providing they are based in the Western, South Wales and Wessex regions and under 35 years, they are eligible to participate – and 2009 finalists include Dan Bray, a 25-year-old graduate student of Cambridge University from Bristol.

Dan and his competitors had to submit a summary of an aerospace related research or development project to their university or workplace. It was then up to the organisation to choose one candidate to enter the WAC Prize. Each paper must be based on current activities in the field of aerospace and a theme of 'sustainability and the environment in aviation' is encouraged, although all projects will be judged fairly.

Dan used an engineering technique, called 'Finite Element Analysis' to find the best possible design for a typical aircraft composite panel. Engineers could find the top designs for a low cost at the tip of their fingertips – by avoiding the study of millions of different possibilities and saving both time and money.

John Cusack, 30, who works for AgustaWestland, a manufacturer of rotorcrafts for the military, developed a method to predict how much heat a helicopter will produce – before it is actually designed. Natalie Hibberd, a 32-year-old Advanced Control Systems Engineer at Rolls-Royce focused on overcoming the challenges to testing developments in control systems.

Commenting on her project, Natalie said: "My research shows that whilst there is a demand for developments in jet engine control software, there is an equal and opposite demand to reduce the related costs and timescales. Therefore, I looked into how computational simulation could provide feasible resolutions through replacing more costly verification methods or complementing them through detecting issues earlier in the design process.

University of Bristol student Gillian Clare, 24, chose to develop a coupled optimization method for the problems of airport taxiway routing and runway scheduling. Her research has concluded that runway scheduling and taxi routing will become more efficient when they are combined into a single mixed integer linear programming (MILP) optimization.

The results show potential for improvement in throughput and taxiing time by managing them simultaneously.

Speaking ahead of the event, Martin Soltau, Chairman of the IMechE Western Aerospace Centre, said: "The judges will be looking for a well structured presentation which tests the young engineer's technical knowledge of aerospace, as well as their business and presentation skills. Engineers need the use of all of these skills throughout their careers.

"With two finalists from industry and two from university, the WAC Prize is moving up a level to encourage younger engineers to take part. For those already working in the aerospace industry, the competition promotes continued professional development and pushes them forward in their area of expertise."

The winner will be presented with £500 by Nick Barnett, former chairman of IMechE Aerospace Industries and Air Support Director for Safety & Engineering at the Ministry of Defence. As part of making the final, all four entrants spent a day with the Red Arrows on 9 March, which included sitting in on the pilots' in-brief for a training sortie, watching the practice display at RAF Scampton and an engineering tour of the hangar.

The presentation takes place at the University of Bristol, on 20 April from 6.30pm.



Cap: (left to right) Finalists Dan Bray, Gillian Clare, John Cusack and Natalie Hibberd at RAF Scampton

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Notes to Editors

- If you would like further information on the submitted papers please contact the IMechE Press Office on 0207 304 6992/6888 or email media@imeche.org. The presentations start promptly at 6.30pm and take place at the University of Bristol.
- The Institution of Mechanical Engineers (IMechE) was established in 1847 and has some of the world's greatest engineers in its history books. It currently has around 80,000 members in 120 countries representing mechanical engineers involved in a diversity of fields such as the automotive, rail, aerospace, medical, power and construction industries to name a few. Visit www.imeche.org for more information.