

Air Traffic Management

“Success through collaboration”

4th June 2009

13:00hrs to 17:00hrs

**BAE Systems’ Park Centre, Farnborough Aerospace Centre,
Farnborough**

Note: All presentations will be available to download after the event from:

<http://www.southeastknp.co.uk/ATMKN/ATMKN>

Programme and Speaker Biographies

13.00 Arrival, Registration & Networking Sandwich Lunch

13:30 Welcoming Remarks—Dr. Mike Shorthose (MD, Helios) & John Copely (CEO, FAC)

13:35 Introduction—Dr. Mike Shorthose (Chairman)

Chair Biography: Dr. Mike Shorthose is the Managing Director of Helios, a management and technology consultancy supporting businesses, governments, regulators and other institutions. Helios is a company that has grown from its roots in Air Traffic Management (ATM) to become Europe’s leading independent air transport consultancy—an achievement recognised by two Queen’s Awards for Enterprise in 2004 and 2009. Mike has worked extensively in the aviation business on a wide range of issues including business advice on the planning and execution of large air traffic control projects, organisational change and cost benefit analysis. Mike is also a technical specialist in the design, standardisation and implementation of aviation technology particularly VHF data links and surveillance systems.

13:40 National Aerospace Technology Strategy and the ATM roadmap—Dr. Tonino Amorelli (Lead Technologist – Transport & HVM, Technology Strategy Board), Dr. Ruth Mallors (Director, Aerospace and Defence Knowledge Transfer Network) and Sameer Savani (Operations Manager, Aerospace and Defence Knowledge Transfer Network)

About the Technology Strategy Board (TSB): The TSB is a business-focused organisation dedicated to promoting technology-enabled innovation across the UK. Much of the TSB’s work is in spreading knowledge, understanding policy, spotting opportunities and bringing people together to solve problems or make new advances. The TSB also invest in and manage a range of delivery mechanisms and programmes to drive technology-enabled innovation.

Speaker Biography: Throughout his professional career, Tonino Amorelli has worked at the interface between industry, academia and government, developing a strategic view of the challenges that innovation can bring. He is currently the Lead Technologist – Transport and acting Lead Technologist for High Value Manufacturing at the Technology Strategy Board. After graduating as a Chemist (BSc/PhD University College Cardiff), he worked for the European Commission assessing Europe’s industrial research and development needs across a number of sectors including transport and energy. On returning to the UK, he worked at the Centre for Exploitation of Science and Technology (CEST) where he led in transport and



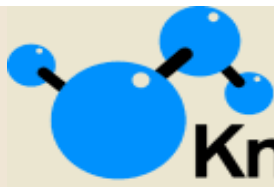
Dr Tonino Amorelli



Dr Ruth Mallors



Sameer Savani



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energy, again working closely with industry and focussing on the challenge of exploiting innovation for UK wealth generation. More recently he has held a strategic consultancy role at QinetiQ.

About the UK Aerospace & Defence Knowledge Transfer Network (KTN): The task of the Aerospace and Defence KTN is to help promote innovation and collaboration across UK industry, government and academia, helping to improve industrial performance and implement the UK National Aerospace Technology Strategy. Priorities include:

- To deliver improved industrial performance through innovation and new collaboration maximising the impact of new research and technology and better co-ordination of resources for the delivery of National Aerospace Technology Strategy.
- To make the UK a more globally competitive environment for investment in aerospace and defence research and technology.
- To facilitate innovation and knowledge transfer across the civil and defence sectors and enable closer collaboration between academia, industry and the Ministry of Defence. The National Technical Committees are core to this aim.
- To improve coherency and effectiveness of industry in science, technology and innovation towards government, supported by more rigorous analysis and technology road-mapping.

Funding is provided by the UK Technology Strategy Board. See: www.aeroktn.co.uk.

Speaker Biography: Dr Ruth Mallors is the Director of the Knowledge Transfer Network for Aerospace and Defence. The KTN is a Technology Strategy Board programme aimed at accelerating business innovation. Over the past 12 years she has worked across multiple sectors including Oil and Gas, Engineering, Retail and Professional Services always in the area of Knowledge Transfer and Change Management to drive business change and enable innovation. Ruth holds a PhD in Chemistry from the University of Edinburgh and a BSc in Chemistry from University College, London.

Speaker Biography: Sameer Savani graduated with a Masters degree in Physics from University College London in 2002, specialising in compressible fluid dynamics. His first role was as a stealth scientist within the MoD's S&T advice centre, the Defence Science and Technology Laboratory, eventually becoming a programme manager for Infra-red signature management for fast-jet propulsion systems. In 2007, Sameer was seconded to the UK's trade association for aerospace and defence manufacturers, the Society of British Aerospace Companies, where he supported the implementation of the National Aerospace Technology Strategy and helped prepare SBAC's bid to host the Aerospace and Defence Knowledge Transfer Network. Since, Sameer has taken on a full time role within the KTN as its Operations Manager. His primary role is to act as the UK's focal point for all aspects of the National Aerospace Technology Strategy, including its underpinning technology roadmaps and infrastructure.

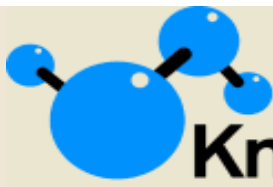
14:20: Afternoon break and networking refreshments

14:40: Wind farm mitigation using new alternatives to radar—Dr. Zoran Dobrosavljevic, (Roke Manor Research)

Submitted Abstract: Electricity generated from wind power, using wind farms, is seen as one of the most promising sources of renewable energy. Substantial growth in the number and size of wind farms, as well the size of individual wind turbines, is therefore expected in the future.

This growth in the number and size of deployed wind turbines around the world is accompanied by growing concern in the aeronautical community that wind farms may have an





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adverse impact the on performance of Primary and Secondary Surveillance Radars (PSR and SSR). A number of studies have been undertaken, and they have shown that wind farms can have an adverse effect on an ability of radars to detect and track targets close to a wind farm, and that in many situations alternative surveillance methods may be needed.

Two aeronautical surveillance techniques that seem to be promising alternatives to PSR and SSR in terms of higher resilience to wind farm interference are Multi-Static Primary Surveillance Radars (MSPSR) and Wide Area Multilateration (WAM) systems respectively. In this presentation, the reasons behind lesser susceptibility of these two surveillance techniques to wind turbine interference will be discussed and the suitable mitigation techniques will be outlined.

Speaker biography: Dr Zoran Dobrosavljevic is a Senior Consultant Engineer at Roke Manor Research. Zoran graduated from School of Electrical Engineering, University of Belgrade, Serbia, in 1986. Upon his graduation, he worked at the Department of Telecommunications at the University of Belgrade, first as an assistant and then as an assistant professor. He received a MSc and PhD from the same University in 1990 and 1995. In 2001, Zoran joined Roke, where he currently holds a position of Senior Consultant Engineer. During the last eight years, he has worked on a number of projects for Eurocontrol, ESA, Astrium, Ofcom, WiMAX Forum, and others. Zoran's expertise is in the area of radio systems engineering; in particular, in the area of aeronautical surveillance, impact of wind farms on Multi-Static Primary Surveillance Radars and Wide Area Multilateration systems, future aeronautical communications, and satellite navigation (GPS and Galileo). Zoran has also been actively involved in a work on Broadband Wireless Access systems (WiMAX and LTE).

15:00: Avoiding the airspace incursions of general aviation—Ben Stanley, (Helios)

Submitted abstract: One of the key risks facing aviation today arises from airspace incursions, primarily from aircraft entering controlled airspace when not cleared to do so. As with any other hazard, risk reduction strategies can be a mix of prevention (of the hazard occurring) and mitigation of the effect once it has occurred. This talk will describe an overall strategy to reduce the occurrence of airspace incursions, focusing on all aspects of mitigations that may be put in place by breaking down the problem into its basic causes. It will look at operational ATC and GA flight crew solutions, along with potential technical solutions both in ground ATC systems and in the cockpit.

Speaker biography: Ben Stanley has spent 10 years working in Air Traffic Management, with clients such as the European Commission, Eurocontrol, ANSPs, airports and the ATM industry. He has a particular interest in the convergence of operations, business and technological enablers for Air Traffic Management. He currently works in several areas of standardisation and regulation, including producing safety cases and standardising applications of new technology. Ben has worked on many projects with General Aviation, including CAA charging reviews, technology investment cases, and safety cases, and is himself a private pilot.

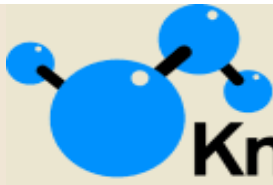
15:20: Networking afternoon tea

15:40: Tokeneer: An open-source demonstration of high-assurance software engineering—Janet Barnes, (Praxis High Integrity Systems)

Submitted abstract: The Tokeneer ID Station (TIS) project was commissioned by the US National Security Agency (NSA) as a demonstration vehicle to show exactly how the Praxis Correctness by Construction software development process matches up to Common Criteria requirements for Evaluation Assurance Level 5 (EAL5) and to measure the productivity and defect rates under controlled conditions.

The project developed this security application using a number of rigorous techniques including formalization of the specification in the Z notation, the use of SPARK as the development language and proof of adherence to the security properties.





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In 2008 a Technology Transfer Agreement was signed by the NSA and Praxis allowing the entire project archive to be made available under a permissive “open source” licence. This is a significant milestone and allows Praxis to show the wider software community how we develop software to high-assurance levels in a cost-effective manner.

This presentation will cover the highlights of Tokeneer, it will include key metrics from the project and provide an overview of the technologies, processes and tools that were used, all of which are applicable to any domain where high-assurance software is required.

Speaker biography: Dr Janet Barnes is a Principal Software Engineer at Praxis with over 15 years experience in the specification, design and development of both security- and safety-critical software. She played a key role in the delivery of the Tokeneer project and has made significant contributions to a number of Praxis' key projects such as SHOLIS, MULTOS CA and most recently iFACTS. Janet is a chartered engineer and was a member of the board of Ada-Europe for five years.

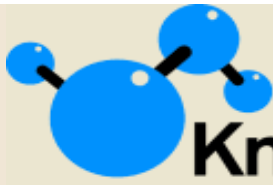
16:00: Sense and Avoid in UAS - state of the art and new solutions —Dr. Plamen Angelov, Intelligent Systems Research Laboratory, Department of Communication Systems, Lancaster University

Submitted Abstract: The problem of sense and avoid (SAA) in unmanned aerial systems (UAS) is central to the safety, mission success and certification for the systems to be routinely used in non-segregated airspace. In this presentation the author will share his experience and research results. First, the problem of SAA in UAS will be formulated and described. Then, the state-of-the art will be reviewed based on the published approaches categorised into several classes: i) based on the kinematics and geometry; ii) based on fuzzy logic; iii) combined approaches iv) relations between collision avoidance and path planning and rules of navigation. This presentation will give an outline and general review of the possible solutions to the problem rather than to focus on specific approaches that were recently developed at Lancaster University (jointly with Cranfield University and BAE Systems).

Speaker biography: Dr Plamen Angelov is a Senior Lecturer and a Senior Member of the IEEE. He is the Vice-Chair of the Technical Committee (TC) on Standards, Computational Intelligence Society, IEEE, a member of the Fuzzy Systems TC, and the funding Chair of the Task Force (TF) on Adaptive Fuzzy Systems. He has authored or co-authored over 120 papers in leading journals and peer-reviewed conference proceedings. He holds a patent, a research monograph, a number of edited volumes, and an active research portfolio in the area of computational intelligence and system modelling, identification, and machine learning. He has discovered internationally recognised pioneering results into on-line and evolving methodologies and algorithms for knowledge extraction in the form of fuzzy rule-based systems of Takagi-Sugeno type.



Dr Plamen
Angelov



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The conventional assumptions that a system model has a pre-defined and fixed structure were challenged by Dr. Angelov. Indeed a wide range of new opportunities to apply this innovative methodology to clustering, classification, time-series prediction, novelty detection, system identification, and control was also pursued—an avenue of work that led to a number of commercial applications being realised from his research. A number of applications (including with industrial partners) were also realised. Dr. Angelov was the PI (Principal Investigator) and co-I of a number of research projects funded by EPSRC, ASHRAE-USA, EC FP6 and 7, The Royal Society, Nuffield Foundation, DTI/BERR and industry. His research contributes to the competitiveness of the UK industry and quality of life through such projects as ASTRAEA -a £32M DTI/BERR-funded programme, in which Dr. Angelov is PI of two projects: i) Collision Avoidance (£150K, 2006/08), and ii) Adaptive Routeing (£75K; 2006/08). The work on this project was recognised by 'The Engineer Innovation and Technology 2008 Award' in two categories: i) Aerospace and Defence and ii) The Special Award.

Other examples of research that has had a direct impact "real life" problems are the BAE Systems-funded projects on Sense and Avoid (PI, £66K; 2006/07); the EPSRC CASE award, co-funded by 4S Information Systems Ltd. 'Better Clinical Decisions for Less Effort – Building prediction software models to improve anticoagulation care to prevent thrombosis and strokes' (co-I, £80K; 2006/09), the EPSRC-funded project (PI, £50K; 2000/01) on 'Application of Fuzzy Rule-based Models in Building HVAC Systems Simulation', the BAE Systems-funded project (co-I, £44K, 2008) on UAV Safety Support.

He serves as an Associate Editor of three international journals and is the co-Editor-in-Chief of the newly established journal 'Evolving Systems' (Springer, to start 2009) and Guest Editor of IEEE Transactions on Fuzzy Systems (2008). Dr. Angelov was the General Chair of the 2006 IEEE Symposium on Evolving Fuzzy Systems, the Vice-Chair of the 3rd International Workshop of Genetic and Evolving Fuzzy Systems, Germany, March 2008, the co-Chair of the Workshop on Evolving and Self-Developing Intelligent Systems, USA, April 2009, the Publication Chair of the FUZZ-IEEE 2007, London, July 2007 – the premier conference in the area of fuzzy systems as well as a member of the Programme Committees of numerous international conferences. Dr. Angelov was a Visiting Professor at the Wolfenbuettel, Germany (2007). He has given a number of invited and plenary talks at leading companies (Ford, The Dow Chemical, Honeywell, USA; QinetiQ, BAE Systems, Thales, etc.) and universities (Michigan, USA; Delft, the Netherlands; Leuven, Belgium, Linz, Austria, Campinas, Brazil, Wolfenbuettel, Germany, etc). More information can be found at www.lancs.ac.uk/staff/angelov.

16:20 Closing Remarks—Dr. Mike Shorthose (Chairman)

16:30 Networking refreshments

17:00 Depart

