

Imperial College
London

ATACCS' 2012

2nd International Conference
on Application and Theory of Automation
in Command and Control Systems

29 - 31 May 2012, Imperial College London, UK

Organised by:



In Cooperation with:



ATACCS' 2012

Conference Overview

About ATACCS

ATACCS' 2012 is the second of a series of scientific conferences on the theme of Automation in Command and Control Systems. The first was organised in Barcelona, Spain, and gathered more than one hundred participants.

ATACCS is focused on **applications and theories** that are related to the **replacement of human roles by technology** (i.e. through automation). In the context of ATACCS, automation implies the use of systems to administer the tasks of humans including **conformance monitoring and automation management**. This raises enormous **technical, ethical, organisational and safety challenges**.

ATACCS is the brainchild of the **HALA! Research Network** (Higher Automation Levels in Air Traffic Management) which is supported by **SESAR WP-E**, a framework setup to spearhead long term and innovative research in **automation of Air Traffic Management** in pursuit of the SESAR 2020 vision and beyond. Despite this strong relationship with ATM, **ATACCS welcomes all other domains and industries dealing with automation in command and control systems**.

Keynote Speakers

ATACCS' 2012 is delighted to present keynote speeches by:

Prof. R. John Hansman, Jr.
Professor of Aeronautics
and Astronautics,
Massachusetts Institute of
Technology, Cambridge (US)



Dr Aslaug Haraldsdottir
Technical Fellow,
The Boeing Company,
Seattle (US)



Dr Anthony Smoker
Manager Safety Performance
and Improvement,
Swanwick Air Traffic Control
Centre, NATS, Southampton (UK)

Best PhD Paper Award

The Boeing Company honours the most rigorous and relevant PhD paper to the field. The winner is announced at the third day of the ATACCS conference.

Topics of Interest

- Assessment of Systems with Automation
- Autonomous System Design
- Design Automation
- Decision Support Systems
- Function Allocation
- Human-Automation Collaboration
- Human-System Integration
- Information Automation
- Model Validation
- Optimisation Algorithms
- Process Control
- System Supervision
- System Modelling and Simulation

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Conference Programme

Conference Day 1, Tuesday 29th May 2012

Plenary Opening Session Day 1

08:15-09:00	Registration & Coffee	
09:00-09:20	Chairs' Welcome	Prof Washington Ochieng Imperial College London Prof Francisco Sáez Technical University of Madrid
09:20-09:30	Sponsors Welcome	Nicolás Suarez EATRADA
09:30-09:45	Introduction to the Programme	Prof Philippe Palanque Paul Sabatier University Dr Anthony Smoker Manager Safety Performance and Improvement, Swanwick Air Traffic Control Centre, NATS
09:45-10:45	Keynote	

10:45-11:15 Networking Coffee Break & Poster Session

Session 1: Human-Automation Collaboration (Session Chair: Prof Chris Johnson)

11:15-11:40	The Interplay between TCAS and ATC	Amy R. Pritchett , et al. Georgia Institute of Technology
11:40-12:05	Using Complementary Model S-Based Approaches for Representing and Analysing ATM Systems' Variability	Célia Martinie , et al. University Paul Sabatier, IRIT
12:05-12:30	Assessing the Safety Impact of Pilot-to-Airliner HMI Latencies in the context of ATM	Markus Vogel , et al. TU Dresden

12:30-13:30 Lunch

Session 2: Decision Support Systems (Session Chair: Prof Philippe Palanque)

13:30-13:55	Efficient Conflict Resolution Method in Air Traffic Management based on the Speed Assignment	Jose Antonio Cobano , et al. University of Seville
13:55-14:20	On Interfacing Multi Objective Optimisation Models – The Case of the Airport Gate Assignment Problem	Ignacy Kaliszewski , et al. Warsaw School of Information Technology
14:20-14:45	Expectations from a Steering Control Transfer to Cockpit Crews for Aircraft Pushback	Franziska Dieke-Meier , et al. TU Dresden

14:45-15:15 Poster Teaser Session

15:15-15:40 Networking Coffee Break & Poster Session

PhD Session I: Automation Strategies in ATM (Session Chair: Prof Lena Martensson)

15:40-16:00	New Concept of Automated Air Traffic Control System.	Dragoljub Patchev , et al. M-NAV Macedonian Air Navigation Service
16:00-16:20	Effective Automation in ATM: A New Perspective on Management and Control of Automated Systems	Martina Ragosta , et al. University Paul Sabatier, IRIT, Deep Blue
16:20-16:40	A Knowledge-Based Flight State Evaluation Approach Using Machine Learning Technology	Lutz Bretschneider , et al. TU Braunschweig
16:40-17:00	Identifying Airspace Capacity Factors in the Air Traffic Management System	Gonzalo Tobaruela , et al. Imperial College London

17:00-17:40 Brainstorming Session: Automation Strategies in ATM

19:30 Conference Dinner, Location: Senior Common Room (SCR)

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Conference Programme

Conference Day 2, Wednesday 30th May 2012

Plenary Opening Session Day 2

08:00-08:30 Registration & Coffee

08:30-08:45 Introduction to the Programme – Day 2

Prof Chris Johnson
University of Glasgow

08:45-09:45 Keynote

Prof R. John Hansman, jr.
Professor of Aeronautics and Astronautics,
Massachusetts Institute of Technology

Session 3: Unmanned Aircraft Systems (Session Chair: Dr Dirk Schaefer)

09:45-10:10 Advanced Sensing Issues for UAS Collision Avoidance

Domenico Accardo, et al.
Università degli Studi di Napoli "Federico II"

10:10-10:35 A Taxonomy of UAS Separation Maneuvers and their Automated Execution

Enric Pastor, et al.
Technical University of Catalonia (UPC)

10:35-11:00 Networking Coffee Break & Poster Session

Session 4: Trajectory Optimisation (Session Chair: Eduardo Garcia)

11:00-11:25 Trade-off Between Optimum Altitude and Contrail Layer to Ensure Maximum Ecological En-Route Performance Using the Enhanced Trajectory Prediction Model (ETPM)

Michael Kaiser, et al.
TU Dresden

11:25-11:50 Understanding Time-Drift for Different Aircraft Descent Guidance Strategies

Jesper Bronsvoort, et al.
Air Services Australia

11:50-12:15 An Overview of Airborne Time-Spacing Research in the JADE Program

Eri Itoh, et al.
Electronic Navigation Research Institute (ENRI)

12:15-12:40 Air Traffic Flow Management Under Uncertainty: Application of Chance Constraints

Gillian Clare, et al.
University of Bristol

12:40-13:30 Lunch

PhD Session II: 4D Trajectory Management (Session Chair: Dr Wolfgang Schuster)

13:30-13:50 An Aircraft Dynamic Model for Tracking 4-D Trajectories

Alexander Schwithal, et al.
TU Braunschweig

13:50-14:10 Analysis of the Geometrical Altimetry to Support Aircraft Optimal Vertical Profiles within Future 4D Trajectory Management

Javier García-Heras, et al.
Polytechnic University of Madrid

14:10-14:30 AUTOFLY-Aid: Flight Deck Automation Support with Dynamic 4D Trajectory Management for Responsive and Adaptive Airborne Collision Avoidance

Emre Koyuncu, et al.
Istanbul Technical University

14:30-14:50 Identification and Initial Characterization of Sources of Uncertainty Affecting the Performance of Future Trajectory Management Automation Systems

Enrique Casado, et al.
University of Glasgow

14:50-15:30 Brainstorming Session: 4D Trajectory Management

15:30-16:00 Networking Coffee Break & Poster Session

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Conference Programme

Conference Day 2, Wednesday 30th May 2012 (continued)

PhD Session III: Decision Support and Tools and UAS (Session Chair: Dr Wolfgang Schuster)

16:00-16:20	Pre-tactical Trajectory De-Confliction Algorithm for Air Traffic Management	Catya Zuñiga , et al. Autonomous University of Barcelona
16:20-16:40	Obstacle Tracking Results: Cartesian vs. Spherical Particle Filter	Anna Elena Tirri , et al. Università degli Studi di Napoli "Federico II"
16:40-17:00	Climate Based Navigation – A New Way to Reduce Aviation CO2 Emissions	Djordje Samardzija , et al. University of Belgrade
17:00-17:20	A Stochastic Turnaround Model for Predicting Aircraft Turnaround Times	Thomas Kunze , et al. TU Dresden
17:20-18:00	Brainstorming Session: Decision Support Tools and UAS	
18:00-19:30	Drinks Reception, Networking & Poster Session	
18:30-20:30	HALA! Network Plenary Meeting, Location: Room 163, Skempton Building (for HALA! Network Plenary Members)	

Conference Day 3, Thursday 31st May 2012

Plenary Opening Session Day 3

08:00-08:30	Registration & Coffee	
08:30-08:45	Introduction to the Programme – Day 3	Miguel Vilaplana Boeing Research & Technology Europe
08:45-09:45	Keynote	Dr Aslaug Haraldsdottir Technical Fellow, The Boeing Company

Session 5: Automated Assessments and Information Automation (Session Chair: Dr Alberto Pasquini)

09:45-10:10	Increasing Resilience of ATM Networks using Traffic Monitoring and Automated Anomaly Analysis	Kyle J. S. White , et al. University of Glasgow
10:10-10:35	Automated Speech Recognition in ATC Environment	José Manuel Cordero , et al. Centro de Referencia I+D+i ATM (CRIDA)
10:35-11:00	Networking Coffee Break & Poster Session	

Session 6: Analysis and Validation of Automation (Session Chair: Prof Francisco Saez)

11:00-11:25	Formal Analysis of Safety-Critical System Simulations	Elsa L. Gunter , et al. University of Illinois
11:25-11:50	Organizational and Inter-Organizational Precursors to Problematic Automation in Safety Critical Domains, A Case Study	Simone Rozzi , et al. Middlesex University
11:50-12:15	Simulated Trajectories Generation	Jaime Garcia Saez , et al. Ineco
12:15-13:15	Lunch	

Awards and Closing Remarks

13:15-14:00	Best Research Paper Award and Boeing's Best PhD Paper Award Outlook ATACCS' 2013, Wrap-Up and Close	Prof Washington Ochieng Prof Francisco Saez
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ATACCS' 2012

Conference Venue and Directions

ATACCS' 2012 will be held at the Department of Mechanical Engineering Building at Imperial College London, South Kensington Campus.

Imperial College London,
Department of Mechanical Engineering
(Building no. 28 on the map)
Lecture Theatre Room 220

From Heathrow Airport:

Take the Underground (Piccadilly Line) to South Kensington Station (50 minutes travelling time).

From Gatwick Airport:

Take a train to Victoria station (journey time 40 minutes) and then by Underground, (Circle or District Line; westbound) to South Kensington.

On Foot:

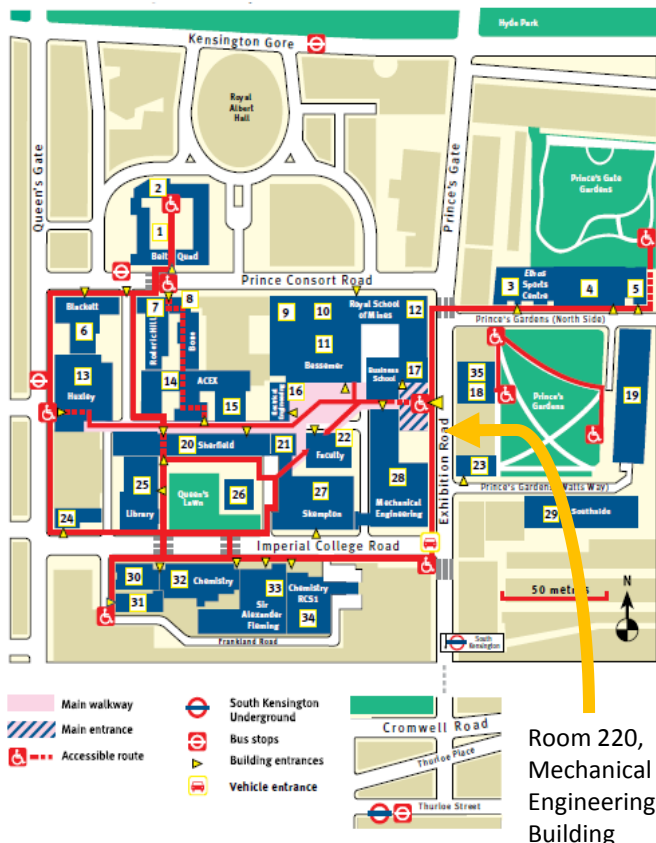
From South Kensington Station, the campus is only a five minute walk. Either follow the subway signposted to the museums or walk north up Exhibition Road. The entrance to the Department of Mechanical Engineering Building and the conference venue is through the Business School main entrance on Exhibition Road.

For further information how to get to the conference venue, please visit:

www.imperial.ac.uk/campusinfo/southkensington

In case of any **further questions** on the conference, please contact **the local organiser**:

Dr Arnab Majumdar,
Tel. +44 (0)79 6898 0811,
Email: a.majumdar@imperial.ac.uk



HALA! Network Plenary Session:

The HALA! Network Plenary Meeting will be held in Room 163 in the Skempton Building (Building no. 27 on the map).

Conference Dinner:

The conference dinner will be held in the Senior Common Room (SCR). The SCR is located on level 2 of the Sheffield Building (Building no. 20 on the map).

Registration:

Conference registration will be on site at the Department of Mechanical Engineering. During registration participants will receive a conference bag including the proceedings.

WIFI Access:

To access the Imperial College's WIFI, please use the following link:

<https://guestaccess.imperial.ac.uk/GuestLogin/GuestLogin.aspx>

Your "Unique ID" is conf46476.