

# The 2012 UKACC International Conference on Control (UKACC Control 2012)

Cardiff, UK, 3-5 September 2012

## PROGRAM AT A GLANCE



<b>Sunday</b> <b>2 September 2012</b>	14:00 - 20:00	Registration
	18:00 - 20:00	Reception
<b>Monday</b> <b>3 September 2012</b>	08:30 - 09:00	Registration
	09:00 - 09:10	Opening Remarks
	09:10 - 10:10	Plenary Speech I
	10:10 - 10:30	Break
	10:30 - 12:30	Parallel Paper Sessions 1
	12:30 - 14:00	Lunch
	14:00 - 15:40	Parallel Paper Sessions 2
	15:40 - 16:00	Break
	16:00 - 17:40	Parallel Paper Sessions 3
	18:30 - 20:30	Dinner
<b>Tuesday</b> <b>4 September 2012</b>	08:30 - 09:00	Registration
	09:00 - 10:00	Plenary Speech II
	10:00 - 10:30	Break
	10:30 - 12:30	Parallel Paper Sessions 4
	12:00 - 14:00	Lunch
	14:00 - 15:40	Parallel Paper Sessions 5
	15:40 - 16:00	Break
	16:00 - 17:40	Parallel Paper Sessions 6
	18:30 - 20:30	Banquet

<b>Wednesday 5 September 2012</b>	08:30 - 09:00	Registration
	09:00 - 10:00	Plenary Speech III
	10:00 - 10:30	Break
	10:30 - 12:30	Parallel Paper Sessions 7 (Industrial session and Mini-Symposia)
	12:00 - 14:00	Lunch
	14:00 - 15:40	Parallel Paper Sessions 8
	15:40 - 16:00	Break
	16:00 - 17:40	Parallel Paper Sessions 9
	17:50 - 18:10	Closing Ceremony
	18:30 - 20:30	Dinner



- MonA1-4 11:30-11:50  
 An Improved Conjugate Gradient Algorithm for Radial Basis Function (RBF) Networks Modelling (156)  
 Long Zhang Queen's University Belfast  
 Kang Li Queen's University Belfast  
 Wang Shujuan Harbin Institute of Technology
- MonA1-5 11:50-12:10  
 Heuristically Optimized RBF Neural Model for the Control of Section Weights in Stretch Blow Moulding (158)  
 Jing Deng Queen's University Belfast  
 Ziqi Yang Queen's University Belfast  
 Kang Li Queen's University Belfast  
 Gary Menary Queen's University Belfast  
 Eileen Harkin-Jones Queen's University Belfast
- MonA1-6 12:10-12:30  
 How to Reduce Congestion on TCP/AQM Networks with Simple Adaptive PID Controllers (78)  
 Teresa Alvarez University of Valladolid  
 Anuar Salim University of Valladolid

**MonA2                    10:30-12:30                    Meeting Room 2**

**Nonlinear Control System Design I**

Chair: Roger Dixon, Loughborough University

Co-Chair: Jie Zhang, Newcastle University

- MonA2-1 10:30-10:50  
 Robust Adaptive Actuator Failure Compensation Controller for Systems with Unknown Time-Varying State Delays (30)  
 Marzieh Kamali Isfahan University of Technology  
 Javad Askari Isfahan University of Technology  
 Farid Sheikholeslam Isfahan University of Technology  
 Ali Khaki Sedigh Khajeh Nasir Toosi University of Technology
- MonA2-2 10:50-11:10  
 Invariant Control of Non-Linear Elements in a Stacked High Redundancy Actuator (223)  
 Thomas Steffen Loughborough University

Roger Dixon  
Roger Goodall

Loughborough University  
Loughborough University

➤ MonA2-3 11:10-11:30

Control of Chaotic Systems with Uncertain Parameters And Stochastic Disturbance by LMPC (163)

Shuang Li  
Guoping Liu

University of Glamorgan  
University of Glamorgan

➤ MonA2-4 11:30-11:50

Hybrid Geno-Fuzzy Controller For Seismic Vibration Control (255)

Monica Patrascu  
Ioan Dumitrache

University Politehnica of Bucharest  
Politehnica University of Bucharest

➤ MonA2-5 11:50-12:10

Optimal Control Scheme for Nonlinear Systems with Saturating Actuator Using  $\varepsilon$ -Iterative Adaptive Dynamic Programming (15)

Xiaofeng Lin  
Yuanjun Huang  
Nuyun Cao  
Yuzhang Lin

Guangxi University  
Guangxi University  
Guangxi University  
Tsinghua University

➤ MonA2-6 12:10-12:30

Active Control of Speed Fluctuations in Rotating Machines Using Feedback Linearization (224)

Mirjam Holm  
Pablo Ballesteros  
Stephan Beitler  
Alex Tarasow  
Christian Bohn

Clausthal University of Technology  
Clausthal University of Technology  
Clausthal University of Technology  
Clausthal University of Technology  
Clausthal University of Technology

**MonA3 10:30-12:30 Meeting Room 3**

**Design Methods of Control Systems I**

Chair: Georgi Dimirovski, Dogus University

Co-Chair: Hidetoshi Oya, The University of Tokushima

➤ MonA3-1 10:30-10:50

An Adaptive Sliding Mode Approach to Decentralized Control of Uncertain Systems (109)

Zheng Huang

University of Hull

Ron Patton

University of Hull

➤ MonA3-2

10:50-11:10

A Novel Decoupling Control Method for Multivariable Systems with Disturbances (152)

Ruijuan Liu

Central South University

Guoping Liu

University of Glamorgan

Min Wu

Central South University

➤ MonA3-3

11:10-11:30

Robust Decentralized Control Design Using Integral Sliding Mode Control (159)

Eshag Larbah

University of Hull

Ron J Patton

University of Hull

➤ MonA3-4

11:30-11:50

Synthesis of Variable Gain Controllers Based on LQ Optimal Control for a Class of Uncertain Linear Systems (33)

Hidetoshi Oya

The University of Tokushima

Yuhei Uehara

The University of Tokushima

➤ MonA3-5

11:50-12:10

Output Regulation for Switched Linear Systems with Different Coordinate Transformations (87)

Xiaoxiao Dong

Northeastern University

Xi Ming Sun

Dalian University of Technology

Jun Zhao

Northeastern University

Georgi Dimirovski

Dogus University

➤ MonA3-6

12:10-12:30

Design of Switching Adaptive Laws for the State Tracking Problem (89)

Caiyun Wu

Northeastern University

Georgi Dimirovski

Dogus University

Jun Zhao

Northeastern University

**MonA4                    10:30-12:30                    Meeting Room 4**

**Control Theory and Applications**

Chair: Keith Godfrey, University of Warwick

➤ MonA4-1

10:30-10:50

An Adaptive Observer-based Parameter Estimation Algorithm With Application to Road

Gradient and Vehicle's Mass Estimation (124)

Muhammad Mahyuddin	University of Bristol
Jing Na	ITER Organisation
Guido Herrmann	University of Bristol
Xuemei Ren	Beijing Institute of Technology
Phil Barber	Jaguar and Land Rover Research

➤ MonA4-2 10:50-11:10

Experimental Study of a Capsbot for Two Dimensional Movements (274)

M. Nazmul Huda	Staffordshire University
Hongnian Yu	Staffordshire University
Michael Goodwin	Staffordshire University

➤ MonA4-3 11:10-11:30

Wind Turbine Sensor Fault Tolerant Control via a Multiple-Model Approach (154)

Montadher Sami	The University of Hull
Ron J Patton	The University of Hull

➤ MonA4-4 11:30-11:50

Stability Control of a Railway Vehicle Using Absolute Stiffness and Inerters (160)

Alejandra Z. Matamoros-Sanchez	Loughborough University
Roger M. Goodall	Loughborough University
Argyrios Zolotas	Loughborough University
Jason Zheng Jiang	University of Cambridge
Malcolm C. Smith	University of Cambridge

➤ MonA4-5 11:50-12:10

A Multiobjective Trajectory Optimisation Method for Planning Environmentally Efficient Trajectories (189)

Quintain McEnteggart	Cranfield University
James Whidborne	Cranfield University

**MonB1 14:00-15:40 Meeting Room 1**

**Plantwide Control (invited session)**

Chair: Yi Cao, Cranfield University

Co-Chair: Antonio C.B. Araujo, Federal University of Campina Grande

➤ MonB1-1 14:00-14:20

A Formulation for Globally Optimal Controlled Variable Selection (108)

Lingjian Ye Zhejiang University  
Yi Cao Cranfield University

➤ MonB1-2 14:20-14:40

Branch and Bound Method for Globally Optimal Controlled Variable Selection (82)

Vinay Kariwala ABB Global Industries & Services Ltd  
Lingjian Ye Zhejiang University  
Yi Cao Cranfield University

➤ MonB1-3 14:40-15:00

Control Structure Selection for Optimal Operation of a Heat Exchanger Network (218)

Johannes Jäschke Norwegian University of Science and Technology  
Sigurd Skogestad Norwegian University of Science and Technology

➤ MonB1-4 15:00-15:20

Plantwide Control of A Benchmark Bleach Plant (225)

Jie Zhang Newcastle University  
Fernando Suárez Antelo Newcastle University

➤ MonB1-5 15:20-15:40

Eco-efficiency of Control Configurations Using Exergy (190)

Tajammal Munir The University of Auckland  
Wei Yu The University of Auckland  
Brent R. Young The University of Auckland

**MonB2 14:00-15:40 Meeting Room 2**

**Nonlinear Control System Design II**

Chair: Zhengdao Ding, University of Manchester

Co-Chair: Zahra Sangelaji, University of Greenwich

➤ MonB2-1 14:00-14:20

Low Eigenvalue Sensitivity Eigenstructure Assignment to Linear Parameter Varying Systems (177)

Fengming Shi University of Hull  
Ron J. Patton University of Hull

➤ MonB2-2 14:20-14:40

Phase Modulation of Robust Variable Structure Control for Nonlinear Aircraft (110)

Yimeng Tang University of Hull



Ron Patton University of Hull

➤ MonB2-3 14:40-15:00

Frequency-Domain Tuning of Fixed-Structure Control Systems (36)

Pascal Gahinet MathWorks

Pierre Apkarian ONERA/Universite Paul Sabatier

➤ MonB2-4 15:00-15:20

Robust  $H_\infty$  Control for a Class of Uncertain Nonlinear Switched Systems (44)

Ben Niu Northeastern University

Rui Wang Dalian University of Technology

Georgi Dimirovski Dogus University

Jun Zhao Northeastern University

➤ MonB2-5 15:20-15:40

An Investigation on the Design and Performance Assessment of double-PID and LQR Controllers for the Inverted Pendulum (251)

Wende Li Harbin Institute of Technology

Kai Cheng Brunel University

Hui Ding Harbin Institute of Technology

**MonB3 14:00-15:40 Meeting Room 3**

**Networked Control Systems and Applications I**

Chair: Wenshan Hu, Wuhan University

Co-Chair: Burkhard Hensel, Dresden University of Technology

➤ MonB3-1 14:00-14:20

An Adaptive PI Controller for Room Temperature Control with Level-Crossing Sampling (250)

Burkhard Hensel Dresden University of Technology

Volodymyr Vasyutynskyy Dresden University of Technology

Joern Ploennigs Dresden University of Technology

Klaus Kabitzsch Dresden University of Technology

➤ MonB3-2 14:20-14:40

Fault Detection with MAC Delay Compensation in Wireless Sensor Actuator Networks (220)

Xuewu Dai Southwest University

Yang Yang Shanghai Institute of Microsystem and Information Technology

Yu Zhang National Engineering Research Center for Broadband Networks and

- |   |  |                                 |
|---|--|---------------------------------|
|   |  | Applications                    |
| Zhiwei Gao  |  | Northumbria University          |
| Hong Wang   |  | University of Manchester        |
| ➤ MonB3-3   |  | 14:40-15:00                     |
| Stability Analysis of Dynamic Quantized Feedback System With Packet Loss (54)       |  |                                 |
| Mu Li   |  | Beijing Institute of Technology |
| Jian Sun  |  | Beijing Institute of Technology |
| Lihua Dou   |  | Beijing Institute of Technology |
| ➤ MonB3-4   |  | 15:00-15:20                     |
| Design and Simulation of Fuzzy Controller Based (IPM) Converter Fed DC Motors (246) |  |                                 |
| Ahmed Abdallah  |  | BIT                             |
| Yuanqing Xia  |  | BIT                             |
| Bo Liu  | King Fahd University of Petroleum and Minerals |                                 |
| ➤ MonB3-5   |  | 15:20-15:40                     |
| Design of Web-based Smart Home with 3D Virtual Reality Interface (280)              |  |                                 |
| Wenshan Hu  |  | Wuhan University                |
| Hong Zhou   |  | Wuhan University                |
| Yiyang Lu   |  | Wuhan University                |
| Chaoyang Lin  |  | Wuhan University                |
| Xianfeng Chen   |  | Wuhan University                |
| Zhen Chen   |  | Wuhan University                |

**MonB4                    14:00-15:40                    Meeting Room 4**

**Control Theory**

Chair: Keith Godfrey, University of Warwick

- |   |  |                                 |
|---|--|---------------------------------|
| ➤ MonB4-1   |  | 14:00-14:20                     |
| New Stability Criteria for Linear Systems with Time-Varying Interval Delay (39)                                   |  |                                 |
| Jian Sun  |  | Beijing Institute of Technology |
| Jie Chen  |  | Beijing Institute of Technology |
| Guoping Liu   |  | University of Glamorgan         |
| ➤ MonB4-2   |  | 14:20-14:40                     |
| Stability of the Observer-Based Pole Placement for Discrete Time-Varying Non-Lexicographically-Fixed Systems (86) |  |                                 |

Yasuhiko Mutoh Sophia Univ.  
Tomohiro Hara Sophia Univ.

➤ MonB4-3 14:40-15:00

Periodic Disturbance Rejection of a Class of Nonlinear System (91)

Xiafei Tang The University of Manchester  
Zhengtao Ding The University of Manchester

➤ MonB4-4 15:00-15:20

A Systematic Selection of An Alternative Parameterisation for Predictive Control (16)

Bilal Khan University of Sheffield  
John Anthony Rossiter University of Sheffield

➤ MonB4-5 15:20-15:40

Stability analysis and Control design of a Class of Event Based Control Systems (227)

J. Jugo University of Basque Country  
M. Eguiraun ESS-Bilbao Consortium

**MonC1 16:00-17:40 Meeting Room 1**

**Batch Process Monitoring and Control (invited session)**

Chair: Ognjen Marjanovic, University of Manchester

Co-Chair: Hongwei Zhang, Sheffield Hallam University

➤ MonC1-1 16:00-16:20

Sensitivity of Optimal Operation of an Activated Sludge Process Model (126)

Antonio Araujo Fed. Univ. of Campina Grande  
Simone Gallani Federal University of Campina Grande  
Michela Mulas Aalto University  
Sigurd Skogestad Norwegian University of Science and Technology

➤ MonC1-2 16:20-16:40

Trajectory Tracking of Batch Product Quality Using Intermittent Measurements and Moving Window Estimation (140)

Jian Wan University of Manchester  
Ognjen Marjanovic University of Manchester  
Barry Lennox University of Manchester

➤ MonC1-3 16:40-17:00

Batch-to-batch Iterative Learning Control Using Linearised Models with Adaptive Model

Updating (199)

Jie Zhang	Newcastle University
Jega Jewaratnam	Newcastle University
J. Morris	Newcastle University
A. Hussain	University of Malaya

➤ MonC1-4 17:00-17:20

An Investigation into Sub-Optimal Control on The Downstream Processing of A Large Scale Industrial Process (90)

Stephen Goldrick	Newcastle University
Barry Lennox	University of Manchester
Keith Smith	Perceptive Engineering
David Lovett	Perceptive Engineering
Gary Montague	Newcastle University

➤ MonC1-5 17:20-17:40

Intelligent Software Sensors and Process Prediction for Glass Container Forming Processes based on Multivariate Statistical Process Control Techniques (200)

Dean Butler	Ardagh Group
Hongwei Zhang	Sheffield Hallam University

**MonC2 16:00-17:40 Meeting Room 2**

**Unmanned Air Vehicles (invited session)**

Chair: Wen-Hua Chen, Loughborough University

Co-Chair: Antonios Tsourdos, Cranfield University

➤ MonC2-1 16:00-16:20

Towards a Fully Autonomous Swarm of Unmanned Aerial Vehicles (203)

Jeremie Leonard	Cranfield University
Al Savvaris	Cranfield University
Antonios Tsourdos	Cranfield University

➤ MonC2-2 16:20-16:40

Development of an Autopilot System for Rapid Prototyping of High Level Control Algorithms (133)

Matthew Coombes	Loughborough University
Owen McAree	Loughborough University
Wenhua Chen	Loughborough University
Peter Render	Loughborough University

➤ MonC2-3 16:40-17:00

Resource Allocation with Cooperative Path Planning for Multiple UAVs (228)

Hyo-Sang Shin Cranfield University  
Cedric Leboucher Cranfield University  
Antonios Tsourdos Cranfield University

➤ MonC2-4 17:00-17:20

Design and Control of Novel Tri-rotor UAV (57)

Mohamed Kara Mohamed The University of Manchester  
Alexander Lanzon The University of Manchester

➤ MonC2-5 17:00-17:20

Singular Perturbation Control of the Longitudinal Flight Dynamics of an UAV (171)

Sergio Esteban University of Seville  
Damian Rivas University of Seville

**MonC3 16:00-17:40 Meeting Room 3**

**Networked Control Systems and Applications II**

Chair: Jihong Wang, University of Warwick

Co-Chair: Xiaoxuan Ma, Beijing University of Civil Engineering and Architecture

➤ MonC3-1 16:00-16:20

Robust Stabilization of Networked Control Systems using the Markovian Jump System Approach (75)

Ashraf Khalil University of Birmingham  
Jihong Wang University of Warwick

➤ MonC3-2 16:20-16:40

Developments in Dependability Modeling of Networked Control Systems (195)

Manoj Kumar Bhabha Atomic Research Centre  
A. Verma Stord/Haugesund university College  
A. Srividya Indian Institute of Technology Bombay  
P.P. Marathe Bhabha Atomic Research Centre

➤ MonC3-3 16:40-17:00

A DNA Sequencing Based Approach to Fault Diagnosis in Automotive Electronic Networks (56)

R. Peter Jones University of Warwick  
Roozbeh Bonyadi University of Warwick

James Taylor  
Mark Amor-Segan

University of Warwick  
University of Warwick

➤ MonC3-4 17:00-17:20

VSW-SOAP: A SOAP Message Transmission Mechanism Based On Variable Sliding Window  
(275)

Xiaoxuan Ma Beijing University of Civil Engineering and Architecture  
Zhixin Chen Beijing University of Civil Engineering and Architecture

➤ MonC3-5 17:20-17:40

Bézier Curve based Trajectory Planning for an Intelligent Wheelchair to Pass a Doorway  
(253)

Ling Chen University of Essex  
Sen Wang University of Essex  
Huosheng Hu University of Essex  
Klaus McDonald-Maier University of Essex

**MonC4 16:00-17:40 Meeting Room 4**

### **Control Applications**

Chair: Keith Godfrey, University of Warwick

➤ MonC4-1 16:00-16:20

A decentralised control strategy for formation flight of unmanned aerial vehicles (116)

Aolei Yang Queen's University Belfast  
Wasif Naeem Queen's University Belfast  
George Irwin Queen's University Belfast  
Kang Li Queen's University Belfast

➤ MonC4-2 16:20-16:40

Experimental Verification of Constrained Iterative Learning Control Using Successive  
Projection (70)

Bing Chu University of Southampton  
Zhonglun Cai University of Southampton  
David Owens University of Sheffield  
Eric Rogers University of Southampton  
Chris Freeman University of Southampton  
Paul Lewin University of Southampton

- MonC4-3 16:40-17:00  
Control Allocation for Fault Tolerant Control of a VTOL Octorotor (139)  
Aryeh Marks Cranfield University  
James Whidborne Cranfield University  
Ikuo Yamamoto University of Kitakyushu
- MonC4-4 17:00-17:20  
Attitude Control of VTOL-UAVs (205)  
Maryam Heidarian PN Engineering College, NUST  
Attaullah Memon PN Engineering College, NUST
- MonC4-5 17:20-17:40  
Experimental Validation of a Geometric Method for the Design of Stable and Broadband  
Vibration Controllers Using a Propeller Blade Test Rig (281)  
Ubaid Ubaid University of Sheffield  
Steve Daley University of Southampton  
Simon Pope University of Sheffield  
Ilias Zazas University of Southampton

**MonP1                    16:00-17:40                    Entrance Hall**

**Poster Session 1**

Chair: Fan Zhang, University of Glamorgan

Co-Chair: Kary Thanapalan, University of Glamorgan

- MonP1-1  
Research on Speed-Sensorless Induction Motor Control System Based on Amesim-Simulink  
Simulation (8)  
Xiaoyan Jia Jilin University  
Xue Wang Jilin University  
Xiaohua Xie Jilin University  
Hong Chen China First Automobile Works Group
- MonP1-2  
Adaptive Sliding Mode Control for Spacecraft Attitude Maneuvers with Reduced or  
Eliminated Reaching Phase (22)  
Binglong Cong Beijing Institute of Technology  
Xiangdong Liu Beijing Institute of Technology  
Zhen Chen Beijing Institute of Technology

➤ MonP1-3

Non-fragile Observer Design for Nonlinear Switched Time Delay Systems Using Delta Operator (27)

Ronghao Wang

PLA University of Science and Technology

Jianchun Xing

PLA University of Science and Technology

Ping Wang

PLA University of Science and Technology

Qiliang Yang

PLA University of Science and Technology

➤ MonP1-4

Mean-Square Exponential Stabilization of Packet-Based Networked Systems with Time-Varying Transmission Delays, Packet Losses and Input Missing (53)

Bin Tang

Guangdong University of Technology

Defeng He

Guangdong University of Technology

Yun Zhang

Guangdong University of Technology

➤ MonP1-5

Overview on Computer Forensics Tools (103)

Raza Hasan

Sir Syed University of Engineering & Technology

Salman Mahmood

Sir Syed University of Engineering & Technology

Akshyadeep Raghav

Staffordshire University

➤ MonP1-6

Adaptive Mutation Based Particle Swarm Optimization Algorithm (120)

Jiyang Dai

Nanchang Hangkong University

Jin Ying

Nanchang Hangkong University

➤ MonP1-7

Control for High Heat Chips' Cooling Based on Power Consumption and Temperature Signals (135)

Jian Wang

USTS

Chuan-yang Liu

USTS

➤ MonP1-8

Command Switching Strategy Based Safety Protection Control for Aeroengines (136)

Chao Chen

Northeastern University

Xi Ming Sun

Dalian University of Technology

➤ MonP1-9

Inverse Optimal Robust Control of Singularly Impulsive Dynamical Systems (121)

Natasa Kablar

Lola Institute



## ➤ MonP1-10

Survey on Impact of QMS ISO 9001:2000 in an Organization, Increases the Effectiveness of its Operations (278)

Salman Mahmood

Sir Syed University of Engineering &amp; Technology

Raza Hasan

Sir Syed University of Engineering &amp; Technology

## ➤ MonP1-11

Fault Detection and Isolation for Engine under Closed-Loop Control (55)

Adnan Hamad

Liverpool John Moores University

Dingli Yu

Liverpool John Moores University

J B Gomm

Liverpool John Moores University

Mahavir S Sangha

Test Technology &amp; Emissions, Cummins Inc

## Tuesday, 4 September 2012

**TueA0                    9:00-10:00                    Hall**

**Plenary Speech II: Control Systems Engineering: a Business-Driven Approach**

Speaker: Peter Fleming, University of Sheffield, UK

Stephen Hill, Rolls Royce, UK

Chair: Sarah Spurgeon, University of Kent, UK

**TueA1                    10:30-12:30                    Meeting Room 1**

**Fault Detection and Condition Monitoring I**

Chair: Mahmud Ahmed, Huddersfield University

Co-Chair: Roger Dixon, Loughborough University

## ➤ TueA1-1

10:30-10:50

A Parameter-free Method for Sensor Fault Detection and Isolation in Bilinear Systems (29)

Assia Hakem

LAGIS laboratory

Komi Midzodzi pekpe

LAGIS laboratory

vincent Cocquempot

LAGIS laboratory

## ➤ TueA1-2

10:50-11:10

A New Reconfigurable Fault Tolerant Control Design Based on Laguerre Series (45)

Rahmatollah Heidari

Isfahan University of Technology

Marzieh Kamali

Isfahan University of Technology

Javad Askari

Isfahan University of Technology

- TueA1-3 11:10-11:30  
 Model of a Fusion Cryopumping System for Condition Monitoring (**191**)  
 Nick Wright Loughborough University  
 Roger Dixon Loughborough University  
 Roel Verhoeven Culham Centre for Fusion Energy
- TueA1-4 11:30-11:50  
 Thermal Modelling of an Alternator for Use in a Prediction System (**196**)  
 James Graham Loughborough University  
 Roger Dixon Loughborough University  
 Keith Gregory Loughborough University  
 John Pearson Loughborough University
- TueA1-5 11:50-12:10  
 Fault Detection and Diagnosis using Principal Component Analysis of Vibration Data from  
 a Reciprocating Compressor (**277**)  
 Mahmud Ahmed Huddersfield University  
 M Baqqar Huddersfield University  
 F Gu Huddersfield University  
 A D Ball Huddersfield University
- TueA1-6 12:10-12:30  
 A Robust LPV Fault Detection Approach Using Parametric Eigenstructure Assignment (**252**)  
 Fengming Shi University of Hull  
 Ron Patton University of Hull

**TueA2                    10:30-12:30           Meeting Room 2**

**Nonlinear Control System Design III**

Chair: Keith Burnham, Coventry University

Co-Chair: Hamerlain Faiza, CDTA

- TueA2-1 10:30-10:50  
 Bilinear Approach Employed For Modelling of Continuous Stirred Tank Reactor Processes  
 (**202**)  
 Tomasz Larkowski Coventry University  
 Keith Burnham Coventry University  
 Leszek Koszalka Wroclaw University of Technology

- TueA2-2 10:50-11:10  
The Benefits of Nonlinear Cubic Viscous Damping on The Force Transmissibility of A Duffing-Type Vibration Isolator (73)  
Carmen Ho University of Sheffield  
Zi-Qiang Lang University of Sheffield  
Stephen Billings University of Sheffield
- TueA2-3 11:10-11:30  
Stabilisation of Multi-Input Nonlinear Systems Using Associated Angular Approach (265)  
Zahra Sangelaji University of Greenwich
- TueA2-4 11:30-11:50  
Optimal Output Regulation of Minimum Phase Nonlinear Systems (221)  
Attaullah Memon NUST Pakistan
- TueA2-5 11:50-12:10  
Research on a Novel PID Based Controller for Non-Magnetic Hydraulic Navigation Simulator with Amesim Simulation (181)  
Kaibo Zhou Shanghai Jiaotong University  
Xuyong Wang Shanghai Jiaotong University  
Jianfeng Tao Shanghai Jiaotong University  
Xiaofeng Guo Shanghai Jiaotong University  
Chuanhui Xu Shanghai Jiaotong University
- TueA2-6 12:10-12:30  
Trajectory Tracking Control of A Car-Like Mobile Robot in Presence of Sliding (99)  
Hamerlain Faiza CDTA

**TueA3                    10:30-12:30                    Meeting Room 3**

**Robotics and Automation I**

Chair: Rubens Afonso, ITA

Co-Chair: Sam Wane, Staffordshire University

- TueA3-1 10:30-10:50  
Predictive Control with Trajectory Planning in the Presence of Obstacles (60)  
Rubens Afonso ITA  
Roberto Galvao ITA  
Karl Kienitz ITA

- TueA3-2 10:50-11:10  
 Multitask Trajectory Planning Based on Predictive Control (**61**)  
 Rubens Afonso ITA  
 Roberto Galvao ITA  
 Karl Kienitz ITA
- TueA3-3 11:10-11:30  
 Connected Navigation of Non-Communicating Mobile Agents (**96**)  
 Feza Kerestecioglu Kadir Has University  
 Ahmet Cezayirli Forevo Digital Design Ltd.
- TueA3-4 11:30-11:50  
 Low Cost Obstacle Detection System for Wheeled Mobile Robot (**18**)  
 Ibrahim Nasir Sebha University, Libya
- TueA3-5 11:50-12:10  
 Fuzzy Expert Rule-Based Airborne Monitoring of Ground Vehicle Behaviour (**170**)  
 Hyondong Oh Cranfield University  
 Seungkeun Kim Chungnam National University  
 Hyo-Sang Shin Cranfield University  
 Antonios Tsourdos Cranfield University  
 Brian White Cranfield University
- TueA3-6 12:10-12:30  
 Processing of Bars-Converging Joint and Engineering Application (**279**)  
 Wanjing Luo Tianjin University  
 Jiangping Mei Tianjin University

**TueA4                    10:30-12:30           Meeting Room 4**

**Modelling and Simulation Tools for Control**

Chair: Samuel Sharp, Chess Dynamics Ltd.

Co-Chair: Tarik Sanecharaun, IMI Norgren Co. Ltd.

- TueA4-1 10:30-10:50  
 Modelling of a Pan and Tilt Servo System (**198**)  
 Samuel Sharp Chess Dynamics Ltd.  
 Adam Wicks Chess Dynamics Ltd.  
 Gordana Collier Kingston University

Andrzej Ordys	Kingston University
➤ TueA4-2	10:50-11:10
Deployment of Full Vehicle Simulator for Electrical Control System Validation (208)	
Georgios Tsampardoukas	Jaguar Land Rover
Alexandros Mouzakitis	Jaguar Land Rover
➤ TueA4-3	11:10-11:30
Modelling of Hybrid Plus Retrofit Hybrid System (276)	
Xiao Guo	University of Glamorgan
Jonathon Williams	University of Glamorgan
Guoping Liu	University of Glamorgan
➤ TueA4-4	11:30-11:50
Model-base Predictive Control for Vibration Suppression of a Flexible Manipulator (241)	
Mehdi Abdolvand	Islamic Azad University
Mohamad Hosain Fatehi	Islamic Azad University
➤ TueA4-5	11:50-12:10
Real time Virtual Simulation of Underactuated Pendulum-Driven Capsule System (259)	
Keattikorn Samarngoon	Staffordshire University
Hongnian Yu	Staffordshire University
➤ TueA4-6	12:10-12:30
Modelling and Experimental Investigation of a Current to Pressure Converter (118)	
Tarik Sanecharaun	IMI Norgren Co. Ltd
Dave Thompson	IMI Norgren Co. Ltd
Marc Robertson	IMI Norgren Co. Ltd
Pete Olley	University of Bradford
Andrew Day	University of Bradford

**TueB1                    14:00-15:40           Meeting Room 1**

**Fault Detection and Condition Monitoring II**

Chair: Sarah Spurgeon, University of Kent

Co-Chair: Mabrouka Baqqar, The University of Huddersfield

➤ TueB1-1	14:00-14:20
Research on Fault Diagnosis of TBM Main Bearing Based on Improved BP Neural Network (67)	

Tianrui Zhang	Northeastern University
Lei Geng	Northeastern University
Xueting Fei	Northern Heavy Industries Group Co., Ltd
Tianbiao Yu	Northeastern University
Wanshan Wang	Northeastern University
Xianlei Chen	Northeastern University

➤ TueB1-2 14:20-14:40

A General Regression Neural Network Model for Gearbox Fault Detection using Motor Operating Parameters (248)

Mabrouka Baqqar	The University of Huddersfield
Tie Wang	Taiyuan University of Technology
Mahmud Ahmed	The University of Huddersfield
Fengshou Gu	The University of Huddersfield
Joan Lu	The University of Huddersfield
Andrew Ball	The University of Huddersfield

➤ TueB1-3 14:40-15:00

Data-Driven Fault Detection of Vertical Rail Vehicle Suspension Systems (74)

Xiukun Wei	Beijing Jiaotong University
Limin Jia	Beijing Jiaotong University
Hai Liu	Beijing Jiaotong University

➤ TueB1-4 15:00-15:20

Robust Adaptive Fault Estimation for a Commercial Aircraft Oscillatory Fault Scenario (111)

Xiaoyu Sun	University of Hull
Ron Patton	University of Hull
Philippe Goupil	Airbus Toulouse

➤ TueB1-5 15:20-15:40

A Variable Structure Observer for Unknown Input Estimation in Sampled Systems (7)

Luis Orihuela	University of Seville
Sarah Spurgeon	University of Kent
Xinggong Yan	University of Kent
Francisco Rubio	University of Seville

**TueB2                      14:00-15:40                      Meeting Room 2**

**Control Applications in Transportation Systems I**

Chair: James Whidborne, Cranfield University

Co-Chair: Anthony Rossiter, University of Sheffield

➤ TueB2-1 14:00-14:20

Free Flight Concept Formulation Exploiting Neighbouring Optimal Control Concepts (148)

Saam Hasan University of Sheffield

John Anthony Rossiter University of Sheffield

➤ TueB2-2 14:20-14:40

Path Following for Small UAVs in The Presence of Wind Disturbance (59)

Cunjia Liu Loughborough University

Owen McAree Loughborough University

Wenhua Chen Loughborough University

➤ TueB2-3 14:40-15:00

Design of an Optimized Charge-Blended Energy Management Strategy for a Plugin Hybrid Vehicle (178)

Ravi Shankar Cranfield University

James Marco Cranfield University

Francis Assadian Cranfield University

➤ TueB2-4 15:00-15:20

Modelling Channel Flow over Riblets: Calculating the Energy Amplification (106)

Aditya Kasliwal University of Oxford

Stephen Duncan University of Oxford

Antonis Papachristodoulou University of Oxford

➤ TueB2-5 15:20-15:40

Assessment of Fault Tolerance for Actively Controlled Railway Wheelset (100)

Mohammad Mirzapour University of Salford

T X Mei University of Salford

Imtiaz Hussain Mehran University

**TueB3 14:00-15:40 Meeting Room 3**

**Robotics and Automation II**

Chair: Graham Machin, NPL

Co-Chair: Chenguang Yang, Plymouth University

➤ TueB3-1 14:00-14:20

Step Change Improvements in High-Temperature Thermocouple Thermometry (41)

Graham Machin NPL  
Jonathan Pearce NPL

➤ TueB3-2 14:20-14:40

An Integrated Backstepping and Sliding Mode Tracking Control Algorithm for Unmanned Underwater Vehicles (47)

Bing Sun Shanghai Maritime University  
Daqi Zhu Shanghai Maritime University  
Weichong Li Shanghai Maritime University

➤ TueB3-3 14:40-15:00

Modelling of The Pendulum-Driven Cart System with Friction (266)

Wenjuan Ren Staffordshire University  
Hongnian Yu Staffordshire University  
Sam Wane Staffordshire University

➤ TueB3-4 15:00-15:20

A Theoretical Approach to The Passive Control of Spiral Vortex Breakdown (123)

Ubaid Qadri University of Cambridge  
Matthew Juniper University of Cambridge

➤ TueB3-5 15:20-15:40

Stochastic Neural Network Control of Rigid Robot Manipulator with Passive Last Joint (174)

Jing Li Xidian University  
Chenguang Yang Plymouth University  
Phil Culverhouse Plymouth University  
Hongbin Ma Beijing Institute of Technology

**TueB4 14:00-15:40 Meeting Room 4**

**Networked Control Systems and Applications III**

Chair: Shuang-Hua Yang, Loughbough University

Co-Chair: Wenshan Hu, Wuhan University

➤ TueB4-1 14:00-14:20

Wireless Event-driven Networked Predictive Control Over Internet (43)

Wenshan Hu Wuhan University  
Hong Zhou Wuhan University  
Qijun Deng Wuhan University



➤ TueB4-2 14:20-14:40

Bio-inspired Rate Control Scheme for IEEE 802.11e WLANs (231)

Xin-Wei Yao	Zhejiang University of Technology
Wanliang Wang	Zhejiang University of Technology
Shuang-Hua Yang	Loughbough University
Jian-Wei Zheng	Zhejiang University of Technology
Yue-Feng Cen	Zhejiang University of Technology
Yanwei Zhao	Zhejiang University of Technology

➤ TueB4-3 14:40-15:00

Global Controlled Consensus of Multi-Agent Systems with Different Agent Dynamics and Time-Varying Communication Delay (93)

Wei-Song Zhong	University of Glamorgan
Guoping Liu	University of Glamorgan

➤ TueB4-4 15:00-15:20

Global Bounded Controlled Consensus of Multi-Agents Systems with Non-Identical Nodes and Communication Time-Delay Topology (94)

Wei-Song Zhong	University of Glamorgan
Guoping Liu	University of Glamorgan

**TueC1 16:00-17:40 Meeting Room 1**

**Fault Detection and Condition Monitoring III**

Chair: T X Mei, University of Salford

Co-Chair: Cunjia Liu, Loughborough University

➤ TueC1-1 16:00-16:20

Real Time Estimation of the Wheel-Rail Contact Conditions using Multi-Kalman Filtering and Fuzzy Logic (68)

I Hussain	Mehran University
T X Mei	University of Salford
Mohammad Mirzapour	University of Salford

➤ TueC1-2 16:20-16:40

Fault Diagnosis of Diesel Engine Based on Energy Spectrum Analysis (65)

Hongxia Pan	North University of China
Jifang Men	North University of China

➤ TueC1-3 16:40-17:00  
 Fault Diagnosis using Magnetic Image of PCB (92)  
 Zhuting Yao North University of China  
 Hongxia Pan North University of China

➤ TueC1-4 17:00-17:20  
 Use of Confidence Limits in the Setting of On-Board Diagnostic Thresholds (214)  
 Paul King Jaguar Land Rover  
 Keith Burnham Coventry University

**TueC2 16:00-17:40 Meeting Room 2**

**Control Applications in Transportation Systems II**

Chair: Christopher Ward, Loughborough University

Co-Chair: Ahmed Mekki, LAGIS-Ecole Centrale de Lille

➤ TueC2-1 16:00-16:20  
 Discrete Flight Path Angle Tracking Control of Hypersonic Flight Vehicles Via Multi-rate Sampling (128)  
 Bin Xu Northwestern Polytechnical University  
 Danwei Wang Nanyang Technological University  
 Chenguang Yang Plymouth University  
 Jing Li Xidian University  
 Shixing Wang Tsinghua University

➤ TueC2-2 16:20-16:40  
 Graph Theory : Application to System Recovery (184)  
 Ahmed Mekki LAGIS-Ecole Centrale de Lille  
 Simon Collart Dutilleul LAGIS-Ecole Centrale de Lille

➤ TueC2-3 16:40-17:00  
 Detection of Low Adhesion in the Railway Vehicle Wheel/Rail Interface: Assessment of Multi-Bodied Simulation Data (186)  
 Christopher Ward Loughborough University  
 Roger Goodall Loughborough University  
 Roger Dixon Loughborough University  
 Guy Charles University of Nottingham

➤ TueC2-4 17:00-17:20

A Novel Collaboration Compensation Strategy of Railway Power Conditioner for a High-Speed Railway Traction Power Supply System (256)

Jiixin Yuan	Wuhan University
Chenmeng Zhang	Wuhan University
Baichao Chen	Wuhan University
chao Cai	Wuhan University
Mengkui Yue	Wuhan University
Cuihua Tian	Wuhan University
Bo Chen	Wuhan University
Jiabin Jia	University of Leeds

➤ TueC2-5 17:20-17:40

Isochronal Synchronization in Complex Networks - The Lyapunov-Krasovskii Theorem and Stability in The Network Parameter Space (210)

Jose Mario Grzybowski	ITA
Elbert Macau	INPE
Takashi Yoneyama	ITA

**TueC3 16:00-17:40 Meeting Room 3**

### **Robotics and Automation III**

Chair: C. James Taylor, Lancaster University

Co-Chair: Zijiang Yang, Ibaraki University

➤ TueC3-1 16:00-16:20

Synchronized Tracking Control of Multiple Euler-Lagrange Systems (14)

Zi-Jiang Yang	Ibaraki University
Pan Qin	Kyushu University
Yoshiyuki Shibuya	Ibaraki University

➤ TueC3-2 16:20-16:40

Robust hybrid fuzzy logic control of a novel twowheeled robotic vehicle with a movable payload under various operating conditions (235)

Abdullah Almeshal	University of Sheffield
Mohammad Tokhi	University of Sheffield
Khaled Goher	Sultan Qaboos University, Oman

➤ TueC3-3 16:40-17:00

A Novel Hybrid Spiral Dynamics Bacterial Chemotaxis Algorithm for Global Optimization with Application to Controller Design (175)

Nasir Ahmad Nor Kasruddin	University of Sheffield
Mohammad Tokhi	University of Sheffield
Nor Maniha Abd Ghani	University of Sheffield
Mohd Ashraf Ahmad	Universiti Malaysia Pahang

➤ TueC3-4 17:00-17:20

State-dependent control of a hydraulically-actuated nuclear decommissioning robot (48)

David Robertson	Lancaster University
C. James Taylor	Lancaster University

➤ TueC3-5 17:20-17:40

Design and Control of Material Transport System for Automated Guided Vehicle (271)

Xing Wu	Nanjing University of Aeronautics and Astronautics
Peihuang Lou	Nanjing University of Aeronautics and Astronautics
Cai Qixiang	Nanjing University of Aeronautics and Astronautics
Chidong Zhou	Nanjing University of Aeronautics and Astronautics
Ke Shen	Nanjing University of Aeronautics and Astronautics
Chen Jin	Nanjing University of Aeronautics and Astronautics

**TueC4                      16:00-17:40                      Meeting Room 4**

**Artificial Intelligence in Control**

Chair: Martin Brown, University of Manchester

Co-Chair: Pooneh Bagheri Zadeh, Staffordshire University

➤ TueC4-1 16:00-16:20

A Novel Adaptive Approach for Home Care Ambient Intelligent Environments with an Emotion-Aware System (141)

Sherief Mowafey	University of Glamorgan
Steve Gardner	University of Glamorgan

➤ TueC4-2 16:20-16:40

A Convergence Analysis of D-ILC Algorithm (261)

Inam Ul Hasan Shaikh	The University of Manchester
Martin Brown	The University of Manchester

➤ TueC4-3 16:40-17:00

Stability Analysis and Control of Linear Periodic Time-Delay Systems with State-Space Models Based on Semi-Discretization (166)

Chenhui Shao	University of Michigan
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Jie Sheng

USTC

➤ TueC4-4

17:00-17:20

Image resolution Enhancement Using Multi-Wavelet and Cycle-Spinning (117)

Pooneh Bagheri Zadeh

Staffordshire University

Akbar Sheikh Akbari

Staffordshire University

➤ TueC4-5

17:20-17:40

Configurations of Binary Distillation column for Optimal Control (155)

Abdelmadjid Khelassi

University M'Hamed Bougara of Boumerdes

Riad Bendib

University M'Hamed Bougara of Boumerdes

Abdelhai Benhalla

University M'Hamed Bougara of Boumerdes

**TueP1**

**16:00-17:40**

**Entrance Hall**

**Poster Session 2**

Chair: Jian Sun, Beijing Institute of Technology

Co-Chair: Cunjia Liu, Loughborough University

➤ TueP1-1

Finding Risk Dominance Strategy in Imperfect Game, A Theory Perspective (219)

Seyyed Mohamamd Reza Farshchi

Department of Data Mining Advanced Research  
Center

Irene Kehvazadeh

Department of Data Mining Advanced Research  
Center

➤ TueP1-2

Robust  $H_\infty$  Control of Singular Systems over Networks with Data Packet Dropouts (21)

Yongbo Lai

JSIT

Guoping Lu

JSIT

➤ TueP1-3

dSpace Based Direct-driven Permanent Magnet Synchronous Wind Power System Modeling and Simulation (232)

Yanxia Shen

Jiangnan University

Fan Li

Jiangnan University

Dinghui Wu

Jiangnan University

Tinglong Pan

Jiangnan University

Xiangxia Liu

Jiangnan University

➤ TueP1-4

Study of MA protection based on Homomorphic Encryption and Composite Function Technology (234)

Jiehong Wu	Shenyang Aerospace University
Yin Hang	Shenyang Aerospace University
Zhang Po	Shenyang Aerospace University
Shi Xiangbin	Shenyang Aerospace University

➤ TueP1-5

Adaptive Control Design of Uncertain Piecewise-Linear Systems (238)

Nanzhu Lin	Jilin University
Xin Wang	Changchun University of Technology
Yanan Zhang	Changchun University of Technology
Chunze Wang	Jilin University
Shu Diao	Jilin University

➤ TueP1-6

Polynomial Accelerated Algorithm Base on Minimizing TV for Computerized Tomographic Image Reconstruction (240)

Kang Hui	South China University of Technology
Gao Hongxia	South China University of Technology
Hu Yueming	South China University of Technology

➤ TueP1-7

CAN Based Unified Customizable Diagnostic Measure Research And Realization (244)

Yan Song	SIA
Tianran Wang	SIA
Aidong Xu	SIA
Kai Wang	SIA
Zhijia Yang	SIA

➤ TueP1-8

Implementation of Network Control Systems for Improvement of Traditional Dyeing Processes (113)

Jidai Wang	SDUST
Ai Qin Sun	SDUST
DongYue Zhang	SDUST
Yali Xue	Tsinghua University

➤ TueP1-9

Design and Implementation of Real-Time Control System Using RTAI and Matlab/RTW (13)

Baoran An  
Guoping Liu  
Senchun Chai

Harbin Institute of Technology  
University of Glamorgan  
Beijing Institute of Technology

➤ TueP1-10

Video Transmission on JXTA (183)

Zhanyu Wang  
Guoping Liu  
Zhenfu Cui

Harbin Institute of Technology  
Harbin Institute of Technology  
Beijing Institute of Technology

➤ TueP1-11

A Real-Time Optimization Control Strategy for Power Management in Fuel Cell/Battery Hybrid Power Sources (107)

Chunyan Li  
Guoping Liu  
Geng Zheng

Institute of Automation  
University of Glamorgan  
Institute of Automation

## Wednesday, 5 September 2012

**WedA0**            **9:00-10:00**            **Hall**

**Plenary Speech II: Aircraft Tonal Active Noise Control Techniques and Their Re-use**

Speaker: Ian Stothers, Ultra Electronics Controls, UK

Chair: Duc Pham, University of Birmingham, UK

**WedA1**            **10:30-12:30**            **Meeting Room 1**

**IMechE Mini-Symposium: Unmanned Marine Vehicles – The Benefits of using Control Algorithms**

Organiser: The Institution of Mechanical Engineers (IMechE)

Chair: Robert Sutton, Plymouth University

Co-Chair: Sanjay Sharma, Plymouth University

➤ WedA1-1

10:30-10:50

MPC for AUVs: Modelling, Algorithm Design and Experimental Results

L V Steenson  
A B Phillips

University of Southampton  
University of Southampton

M E Furlong  
S R Turnock  
E Rogers

National Oceanographic Centre  
University of Southampton  
University of Southampton

➤ WedA1-2 10:50-11:10

An Automatic COLREGs-compliant Obstacle Detection and Avoidance System for  
Unmanned Surface Vehicles

S Campbell  
M Abu-Tair  
W Naeem

Queen's University Belfast  
Queen's University Belfast  
Queen's University Belfast

➤ WedA1-3 11:10-11:30

Control Algorithms for an Uninhabited Surface Vehicle

Robert Sutton  
Sanjay K Sharma

Plymouth University  
Plymouth University

➤ WedA1-4 11:30-11:50

ROV LATIS: Next Generation Smart Underwater Vehicle

Edin Omerdic  
Daniel Toal  
Sean Nolan  
Hammad Ahmad

University of Limerick  
University of Limerick  
University of Limerick  
University of Limerick

➤ WedA1-5 11:50-12:10

Development of an Autonomous Surface Vessel

CheeKuang Tam  
Richard Bucknall

University College London  
University College London

➤ WedA1-6 12:10-12:30

The Influence of Unmanned Surface Vehicle Application on Control Functionality

Richard Daltry

Autonomous Surface Vehicles (ASV) Ltd.

**WedA2 10:30-12:30 Meeting Room 2**

**IET Mini-Symposium: Control Challenges/Success Stories in Practical Systems#**

Organiser: The Institution of Engineering and Technology (IET)

Chairs: Dean X Hill, Abbott Diabetes Care

Steve Daley, University of Southampton

Co-Chair: Paul McKenna, Glasgow Caledonian University



- WedA2-1 10:30-10:50  
 Why Software Safety is an Essential Consideration in Medical Control Projects - Risk Management in IEC 62304  
 Nicola Lerigo-Smith Frazer-Nash Consultancy Ltd  
 Alexandra Knight Frazer-Nash Consultancy Ltd  
 David H Smith Frazer-Nash Consultancy Ltd
- WedA2-2 10:50-11:10  
 Artificial Pancreas Emerging Treatment Modality for Type 1 Diabetes  
 Roman Hovorka University of Cambridge
- WedA2-3 11:10-11:30  
 Non Linear Fuzzy Control Applied to a Realistic Missile  
 Iain Cade MBDA (UK)
- WedA2-4 11:30-11:50  
 From Theory to Practice: Graphical System Design with LabVIEW  
 Tammy Seward National Instruments UK & Ireland

**WedA3                    10:30-12:30           Meeting Room 3**

**InstMC Mini-Symposium: Advances in Automotive Control**

Organiser: The Institute of Measurement and Control (InstMC)

Chair: Keith Burnham, Coventry University

- WedA3-1 10:30-11:00  
 Active Versus Passive Control: from Thought Experiment to Formula One Racing  
 Malcolm Smith University of Cambridge
- WedA3-2 11:00-11:18  
 Developments in Traffic and Vehicle Control Systems  
 Pawel Jaworski MIRA Ltd  
 Tim Edwards MIRA Ltd  
 Keith Burnham Coventry University  
 Olivier Haas Coventry University
- WedA3-3 11:18-11:36  
 Concept to Real Time System's Simulation Using Physical Models  
 Will Suart Jaguar Land Rover

- WedA3-4
11:36-11:54
- Applying the F-transform to Electric Vehicle Range Prediction  
Iain Cunningham
Liberty Cars
- WedA3-5
11:54-12:12
- Synchronosity of Automotive Network Control Systems  
Phil Barber
Jaguar Land Rover
- WedA3-6
12:12-12:30
- Legal, Safety and Practical Regenerative Braking Control Challenges  
Selim Oleksowicz  
Mariusz Ruta  
Keith Burnham  
Eddie Curry  
Hector Garces
Coventry University  
Coventry University  
Coventry University  
MIRA Ltd  
MIRA Ltd

**WedA4                    10:30-12:30           Meeting Room 4**

**System Identification I**

Chair:        Kiyoshi Wada, Kyusyu University  
Co-Chair:   Pierre-Daniel Jameson, Cranfield University

- WedA4-1
10:30-10:50
- Experimental Verification of Best Linear Approximation of a Wiener System for Binary Excitations ([97](#))  
Hin Kwan Wong  
Johan Schoukens  
Keith Godfrey
University of Warwick  
Vrije Universiteit Brussel  
University of Warwick
- WedA4-2
10:50-11:10
- An Algorithm for Generating Real Describing Functions ([147](#))  
George Page  
Barry Gomm  
Steve Douglas
LJMU  
LJMU  
LJMU
- WedA4-3
11:10-11:30
- Estimation of Pulmonary Elastance Fuzzy Model bBy Data Combination of Two Respiration Phases ([129](#))  
Masanori Nakamichi  
Shunshoku Kanae
Fukui University of Technology  
Fukui University of Technology

Zi-Jiang Yang Ibaraki University  
Kiyoshi Wada Kyusyu University

➤ WedA4-4 11:30-11:50

Developing Real-Time System Identification for UAVs (143)

Pierre-Daniel Jameson Cranfield University  
Alastair Cooke Cranfield University

➤ WedA4-5 11:50-12:10

Determination of Dynamic Flexure Model Parameters for Ship Angular Deformation Measurement (167)

Wei Wu University of Southampton  
Sheng Chen University of Southampton  
Shiqiao Qin National University of Defense Technology

➤ WedA4-6 12:10-12:30

Dynamical Analysis of a Duolever Suspension System (213)

Ciro Moreno City University  
Maria Tomas-Rodriguez City University  
Simos A Evangelou Imperial College

**WedB1 14:00-15:40 Meeting Room 1**

### **System Identification II**

Chair: Joachim Horn, Helmut-Schmidt-University, Germany

Co-Chair: A Hwas, University of Strathclyde

➤ WedB1-1 14:00-14:20

A Distributed Newton Iteration Based Localization Scheme in Underground Tunnels (173)

Yuanqing Qin HUST  
Chunjie Zhou HUST  
Shuang-Hua Yang Loughborough University  
Fang Wang Loughborough University

➤ Wed B1-2 14:20-14:40

Modeling and Simulation of a Coupled Double-Loop-Cooling System for PEM-Fuel Cell Stack Cooling (28)

Martin Schultze Helmut-Schmidt-University  
Joachim Horn Helmut-Schmidt-University

Michael Kirsten Helmut-Schmidt-University  
Sven Helmker Helmut-Schmidt-University

➤ Wed B1-3 14:40-15:00

Counter-examples Design to Global Convergence of Maximum Likelihood Estimators (49)

Yiqun Zou Central South University  
Xiafei Tang University of Manchester  
Zhengtao Ding University of Manchester

➤ Wed B1-4 15:00-15:20

Identification of Structural Parameters Using Damped Transfer Matrix and State Vector (263)

Nandakumar P Indian Institute of Technology  
Shankar K Indian Institute of Technology

➤ Wed B1-5 15:20-15:40

Model-based Fault Detection and Isolation for Wind Turbine (146)

Reza Katebi University of Strathclyde  
A Hwas University of Strathclyde

**WedB2 14:00-15:40 Meeting Room 2**

**Industrial Process Applications of Control I**

Chair: John Anthony Rossiter, University of Sheffield

Co-Chair: Shurong Li, China University of Petroleum (East China)

➤ WedB2-1 14:00-14:20

Robust MPC algorithms using alternative parameterisations (51)

Bilal Khan University of Sheffield  
John Anthony Rossiter University of Sheffield

➤ WedB2-2 14:20-14:40

Dynamic Optimization of Polymer Flooding with Free Terminal Time based on Maximum Principle (26)

Shurong Li China University of Petroleum (East China)  
Yang Lei China University of Petroleum (East China)  
Xiaodong Zhang China University of Petroleum (East China)  
Qiang Zhang China University of Petroleum (East China)  
Shaowen Peng China University of Petroleum (East China)

➤ WedB2-3 14:40-15:00

Optimal Control for Mixing Enhancement in Boundary Layers at Membrane Walls (249)

Hua Ouyang  
Yuanqing Xia

University of New South Wales  
BIT

➤ WedB2-4 15:00-15:20

Adaptive Feed-Forward and Feedback Control for Oxygen Ratio in Fuel Cell Stacks (62)

Omar Ragb  
D L YU  
JB Gomm

Liverpool John Moors Universty  
Liverpool John Moors Universty  
Liverpool John Moors Universty

➤ WedB2-5 15:20-15:40

A Relaxation-based Approach for the Orthogonal Procrustes Problem with Data Uncertainties (201)

Shakil Ahmed  
Imad Jaimoukha

Imperial College London  
Imperial College London

**WedB3 14:00-15:40 Meeting Room 3**

**Energy Efficiency and Environmental Systems+Estimation and Filtering**

Chair: James Lam, University of Hong Kong

Co-Chair: Kary Thanapalan, University of Glamorgan

➤ WedB3-1 14:00-14:20

Fuzzy Logic Control for Solar Powered Hydrogen Production, Storage and Utilisation System (257)

Fan Zhang  
Kary Thanapalan  
Andy Procter  
Jon Maddy  
Alan Guwy

University of Glamorgan  
University of Glamorgan  
University of Glamorgan  
University of Glamorgan  
University of Glamorgan

➤ WedB3-2 14:20-14:40

Predictive Control Strategy for a Supercritical Power Plant and Study of Influences of Coal Mills Control on its Dynamic Responses (31)

Omar Mohamed  
Bushra Al-Duri  
Jihong Wang

University of Birmingham  
University of Birmingham  
University of Warwick

➤ WedB3-3 14:40-15:00

Energy Management Effects of Integrating Regenerative Braking into a Renewable Hydrogen

Vehicle (193)

Kary Thanapalan	University of Glamorgan
Fan Zhang	University of Glamorgan
Giuliano Premier	University of Glamorgan
Jon Maddy	University of Glamorgan
Alan Guwy	University of Glamorgan

➤ WedB3-4 15:00-15:20

Recursive Filtering for a Class of Nonlinear Systems with Missing Measurements (32)

Jun Hu	Harbin Institute of Technology
Zidong Wang	Brunel University
Bo Shen	University of Duisburg-Essen
Chenxiao Cai	Nanjing University of Science and Technology
James Lam	University of Hong Kong

➤ WedB3-5 15:20-15:40

Renewable Hydrogen Hybrid Electric Vehicles and Optimal Energy Recovery Systems (194)

Kary Thanapalan	University of Glamorgan
Fan Zhang	University of Glamorgan
Giuliano Premier	University of Glamorgan
Alan Guwy	University of Glamorgan
Jon Maddy	University of Glamorgan

**WedB4 14:00-15:40 Meeting Room 4**

**Control for Energy and Sustainability I (special session)**

Chair: Eric Kerrigan, Imperial College London

Co-Chair: Richard Vinter, Imperial College London

➤ WedB4-1 14:00-14:35

Stochastic Control and Smart Grid Technology

Richard Vinter	Imperial College London
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➤ WedB4-2 14:35-15:10

Control, Energy and Sustainability: Ideas for Power Networks, Engine Control and Rail Vehicle Dynamics

Malcolm Smith	University of Cambridge
Glenn Vinnicombe	University of Cambridge
Keith Glover	University of Cambridge

➤ WedB4-3 15:10-15:40  
 Low Order Robust Control in Electric Power System: Current Trends and Future Challenges  
 Bikash Pal Imperial College London

**WedC1 16:00-17:40 Meeting Room 1**

**Algorithms and Architectures of Control Systems II**

Chair: Kang Li, Queen's University Belfast

Co-Chair: A. Verma, Stord/Haugesund university College

➤ WedC1-1 16:00-16:20  
 Singularly Impulsive Dynamical Systems with Time Delay: Mathematical Model and Stability (122)  
 Natasa Kablar Lola Institute  
 Vlada Kvrjic Lola Institute

➤ WedC1-2 16:20-16:40  
 Fault Detection and Isolation for PEMFC Systems under Closed-loop Control (95)  
 Mahanijah Md Kamal Liverpool John Moores University  
 Dingli Yu Liverpool John Moores University

➤ WedC1-3 16:40-17:00  
 Determination of the Domain of Attraction And Regions of Guaranteed Cost for Robust Model Predictive Controllers Based on Linear Matrix Inequalities (81)  
 Fernanda Quelho Rossi ITA  
 Ronaldo Waschburger ITA  
 Roberto Galvao ITA

➤ WedC1-4 17:00-17:20  
 A Control Method to Eliminate Polarization-Induced Phase Distortion in Dual Mach-Zehnder Fiber Interferometer (46)  
 Yang An Tianjin University, China  
 Hao Feng Tianjin University, China  
 Yan Zhou Tianjin University  
 Shijiu Jin Tianjin University  
 Zhoumo Zeng Tianjin University

➤ WedC1-5 17:20-17:40  
 Designing and Finite Element Analysis of Customized Titanium Plate for Mandible (164)

Tianbiao Yu  
Guoqiang Ma  
Tianhua Wei  
Xingjun Qin  
Wanshan Wang

Northeastern University  
Northeastern University  
Northeastern University  
China Medical University  
Northeastern University

**WedC2                    16:00-17:40           Meeting Room 2**

**Industrial Process Applications of Control II**

Chair: Hongnian Yu, Staffordshire University

Co-Chair: Thouraya Merazi-Meksen, University of Science & Technology

➤ WedC2-1 16:00-16:20

A RFID mutual authentication protocol based on AES algorithm ([267](#))

Tuan Pham	Staffordshire University
Mohammad Hasan	Staffordshire University
Hongnian Yu	Staffordshire University

➤ WedC2-2 16:20-16:40

Automatic Detection of Circular Defects During Ultrasonic Inspection ([260](#))

Thouraya Merazi-Meksen	University of Science & Technology H. Boumediene
Malika Boudraa	University of Science & Technology H. Boumediene
Bachir Boudraa	University of Science & Technology H. Boumediene

➤ WedC2-3 16:40-17:00

System Identification and Robust Anti-windup Control for a Helium Liquifier ([142](#))

Jing Na	ITER Organisation
Guang Li	University of Exeter
Ryuji Maekawa	ITER Organization
Luigi Serio	ITER Organization

➤ WedC2-4 17:00-17:20

Trajectory Tracking of Exothermic Batch Reactor using NIR Spectroscopy ([169](#))

Olufemi Osunnuyi	University of Manchester
Ognjen Marjanovic	University of Manchester
Jian Wan	University of Manchester
Barry Lennox	University of Manchester

➤ WedC2-5 17:20-17:40

Decentralized Nonlinear Control of 300MWe Circulating Fluidized Boiler Power Unit ([188](#))





Chair: Eric Kerrigan, Imperial College London  
Co-Chair: Richard Vinter, Imperial College London

- WedC4-1 16:00-16:20  
Passivity Based Control of Microrobots  
Kameswarie Nunna Imperial College London  
Alessandro Astolfi Imperial College London
- WedC4-2 16:20-16:40  
L<sub>1</sub> MPC  
Marco Gallieri University of Cambridge  
Jan Maciejowski University of Cambridge
- WedC4-3 16:40-17:00  
Real-Time Stochastic Optimisation for Non-Convex MPC  
Alison Eele University Cambridge  
Jan Maciejowski University Cambridge
- WedC4-4 17:00-17:40  
Panel discussion on Control for Energy and Sustainability  
Eric Kerrigan Imperial College London  
Malcolm Smith University of Cambridge  
Richard Vinter Imperial College London  
Ian Postlethwaite

**WedP1** **16:00-17:40** **Entrance Hall**

**Poster Session 3**

Chair: Kary Thanapalan, University of Glamorgan  
Co-Chair: Fan Zhang, University of Glamorgan

- WedP1-1  
Backstepping based adaptive sliding mode control for spacecraft attitude maneuvers ([145](#))  
Binglong Cong Beijing Institute of Technology  
Xiangdong Liu Beijing Institute of Technology  
Zhen Chen Beijing Institute of Technology
- WedP1-2  
Necessary and Sufficient Conditions for Consensus of Multi-Agent Systems with Nonlinear Dynamics and Variable Topology ([149](#))

Lijing Dong	BIT
Senchun Chai	BIT
Baihai Zhang	BIT

➤ WedP1-3

Distributed Practical Consensus in Multi-agent Networks with Communication Constrains (63)

Lulu LI	City University of Hong Kong
Daniel Ho	City University of Hong Kong
Jianquan Lu	Southeast University

➤ WedP1-4

Smooth Second-Order Sliding Mode Control Design of PEM Fuel Cell System (204)

Syed Saqib Hussain Rizvi	Mohammad Ali Jinnah University
A. I. Bhatti	Mohammad Ali Jinnah University
Saira Rehman	Mohammad Ali Jinnah University
Qadeer Ahmad	Mohammad Ali Jinnah University
Sohail Iqbal	Mohammad Ali Jinnah University
Zahid Butt	Mohammad Ali Jinnah University

➤ WedP1-5

Rapid Alignment Method of INS with Large Initial Azimuth Uncertainty under Complex Dynamic Disturbances (247)

Xin Liu	Beijing Institute of Technology
Bo Wang	Beijing Institute of Technology
Zhihong Deng	Beijing Institute of Technology
Shunting Wang	Beijing Institute of Technology

➤ WedP1-6

Study on The Method of Multi-agent Generation Algorithm within Special Artificial Society Scene (254)

Zongchen Fan	NUDT
Wei Duan	NUDT
Bin Chen	NUDT
Yuanzheng Ge	NUDT
Xiaogang Qiu	NUDT

➤ WedP1-7

Robust Predictor for Uncertain Dead-Time Systems (262)

Majdeddin Najafi	IUT
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Farid Sheikholeslam  
Saeed Hosseinnia

IUT  
Islamic Azad University

➤ WedP1-8

An Improved On-Line Neuro-Identification Scheme (264)

José A. R. Vargas  
Kevin H. M. Gularte  
Elder M. Hemerly

Universidade de Brasília  
Universidade de Brasília  
Technological Institute of Aeronautics

➤ WedP1-9

Output Consensus of Linear Multi-agent Systems (233)

Xin-Rong Yang  
Guoping Liu

Harbin Institute of Technology  
University of Glamorgan

➤ WedP1-10

Consensusability of Discrete-Time Linear Networked Multi-Agent Systems (258)

Chong Tan  
Guoping Liu

Harbin Institute of Technology  
University of Glamorgan