

23rd CAPE 2015

Manufacturing research and its applications in 21st Century

The University of Edinburgh

PROGRAMME

MONDAY 2 NOVEMBER

14.00	INDUSTRIAL VISIT TO SELEX ES Departing and returning to Pollock Halls of Residence	
19.00	PRE-CONFERENCE WELCOME DRINKS RECEPTION Nelson Room, Pollock Halls	

DAY 1 – TUESDAY 3 NOVEMBER

	CONFERENCE SESSIONS 1 and 2 St Trinnean's Room, Pollock Halls	Ref
09.10	WELCOME Professor Joseph McGeough, FEng FRSE The University of Edinburgh Chairman of CAPE 2015	
09.15	OPENING ADDRESS Professor Lesley Yellowlees, CBE Head of College of Science and Engineering The University of Edinburgh	
09.45	KEYNOTE PRESENTATION Professor Yi Qin, FIMechE, FloN, FHeA, CEng, PhD The University of Strathclyde <i>Micro-Manufacturing Research: Drivers and Latest Developments</i>	003
10.15	KEYNOTE PRESENTATION David Gow, CBE FEng, Head of SMART Services NHSLothian <i>Medical Engineering - From Patent to Product - the story of the i-limb from 1993 to 2007</i>	006
10.45	KEYNOTE PRESENTATION Professor Daniel Esser RAEng/Selex ES Chair in Laser Device Physics & Engineering Heriot-Watt University <i>Laser device technology for laser-based manufacturing</i>	028
11.15	COFFEE	
11.45	KEYNOTE PRESENTATION Professor Ian Underwood FEng, FRSE Head of the Institute for Integrated Micro-and Nano-systems The University of Edinburgh <i>Manufacturing Beyond Moore's Law</i>	

12.15	KEYNOTE PRESENTATION Professor David Harrison Professor of Design and Manufacturing Glasgow Caledonian University Late Deacon of Hammermen of Glasgow <i>How manufacturers can compete through servitization and advanced services</i>	
12.45	LUNCH – JMCC Restaurant	
	SESSION 1: MICRO AND MEDICAL ENGINEERING Chairman: David Harrison	
13.45	Z Niu & K Cheng Brunel University, UK <i>A Multiphysics Oriented Investigation on the Tool Wear in Micro Drilling Metal Matrix Composites (MMC)</i>	007
14.05	M Packianather, Brousseau, G Gonzalez Cardiff University, UK <i>Effects of micro injection moulding on the mechanical properties of selected test specimens</i>	022
14.25	M Helmy, A Elbab, H El-Hofy Egypt-Japan University of Science and Technology, Egypt <i>Multi-objective optimization for CO₂ of PMMA using Taguchi based grey relational analysis</i>	012
14.45	R O'Connor & G McGuinness Dublin City University, Ireland <i>Electrospun yarns – addressing cell infiltration requirements for tissue engineering applications</i>	020
15.05	S. Baron, E. Ahearne, S. Ramirez, C. O'Connell University College Dublin, Dublin, Ireland <i>An Investigation of Force Components in Orthogonal Cutting of Medical Grade Cobalt Chromium Alloy (ASTM F1537)</i>	030
15.25	COFFEE	
	SESSION 2: UNCONVENTIONAL MACHINING Chairman: D Harrison	
15.40	J A McGeough ¹ , G McGuinness ² , G Gavin ³ , B O'Daly ⁴ ¹ The University of Edinburgh, UK, ² Dublin City University, ³ Dublin Institute of Technology and ⁴ Royal College of Surgeons, Ireland <i>Surgical Cutting and Ablation by Unconventional Methods</i>	001
16:00	F Klocke, S Harst, M Zeis, A Klink RWTH Aachen University, Germany <i>Surface Integrity in ECM-Processes - An Analysis on Material Modifications Occurring during Electrochemical Machining</i>	011
16:20	M Yoshida, Y Ishii Tokyo Metropolitan College of Industrial Technology, Japan <i>Study on EDM for Cemented Carbide with Non-flammable Dielectric Liquid(Influence of Supply of Oxygen supplied to Dielectric Liquid on Machining)</i>	015

16:40	F Klocke, T Herrig, M Zeiss, A Klink RWTH Aachen University, Germany <i>Comparison of the Electrochemical Machinability of Electron Beam Melted (EBM) and Casted Gamma Titanium Aluminide TNB-V5</i>	024
	SESSION 3 – MACHINING	
17:00	P Vichare, M Kennedy University of West of Scotland, UK <i>CNC Machine Tool Information Reusability within Virtual Machining Systems</i>	010
17:20	G Skrabalak, A Stwora & B Brudnik Institute of Advanced Manufacturing Technology, Krakow, Poland <i>Optimization of shaping cutting tools made of BNDCC and DDCC composite materials</i>	014
17:40	CLOSE OF DAY 1 CONFERENCE SESSIONS	

19.00 CONFERENCE DINNER – NELSON ROOM, POLLOCK HALLS

DINNER SPEAKER: KEN SCOTT, DIRECTOR, ALEXANDER-DENNIS, Coach and bus manufacturers, Falkirk, UK

DAY 2 - WEDNESDAY 4 NOVEMBER

	SESSION 4: ADVANCED MATERIALS AND COMPOSITES Chairman: J Corney	
09.00	G Skrabalak & A Stwora Institute of Advanced Manufacturing Technology, Krakow, Poland <i>Effective machining of holes with diameter less than 1mm in difficult to cut materials</i>	029
09.20	A De Silva Glasgow Caledonian University, UK <i>Process quality control strategy for reducing manufacturing defects in composite wind turbine blades</i>	018
09.40	L Moreno, P Mativenga & C Diver University of Manchester, UK <i>Structured surface on cutting tools to improve cutting performance</i>	032
10.00	A De Silva Glasgow Caledonian University, UK <i>Effects of processing parameters on multiwall carbon nanotubes (MWCNT) – glass fiber hybrid reinforced polypropylene composites</i>	027
10.20	COFFEE	
	SESSION 5: LAYERED PROCESSES	
10.40	H El-Hofy & I Desouky Egypt-Japan University of Science and Technology, Alexandria, Egypt <i>Rapid prototyping of a new low stiffness hip stem design</i>	017
11.00	M El-Kashouty, A Rennie Lancaster University, UK and Arab Academy for Science and Technology and Maritime Transport, Egypt <i>Integrating additive and subtractive manufacturing technologies for the production of tools in the automotive industry</i>	008
11.20	N Volpato, L Galvao, L F Nunes, L G Scanavini UTFPR, Curitiba, Brazil <i>Combining Heuristics for Tool-path Optimization in Additive Manufacturing</i>	034
11.40	J Murray, S Algodí, P Brown, A Clare University of Nottingham, UK <i>Multi-layer electrical discharge coatings</i>	038
	SESSION 6: FORMING 1 Chairman: H El-Hofy	
12.00	Y Abe, T Saito, K Mori Toyohashi University of Technology, Japan <i>Improvement of joinability in mechanical clinching with dies for control of metal flow of ultra-high strength steel sheets using finite element simulation</i>	031
12.20	M U Siddiqi, J Corney, G Sivaswammy, M Amir, R Bhattacharya University of Strathclyde, UK <i>Incremental sheet forming fixture design and implementation</i>	004

12.40	A Staiano University of Strathclyde, UK <i>Monitoring of ceramic die condition under hot forming processes</i>	040
13.00	LUNCH- JMCC Restaurant	
14.00	M Ward & S Halliday University of Strathclyde, UK <i>Three dimensions of readiness required to achieve future state, technology enabled manufacturing supply chains</i>	002
	SESSION 7: FORMING 2	
14.20	D Marini & J Corney University of Strathclyde, UK <i>Near Net Shape Manufacturing of Metal - A review of Approaches and their Evolutions</i>	039
14.40	H Persson, J M Ritchie & Y Chen Heriot-Watt University, UK <i>21st century technology meeting a 19th century process to manufacture safety-critical components</i>	036
15.00	A D'Annibale, El Mehtedi, F Gabrielli & A M Dilio University of L'Aquila, Italy <i>Process parameter effects on the deformation energy in a sheet-bulk metal forming process for an automotive component</i>	041
15.20	COFFEE	
	SESSION 8: ADVANCED COMPUTING CAD AND FEA AND SUPPLY CHAINS	
15.40	S Haeri, J Sun The University of Edinburgh <i>Simulation of particle flow in selective laser sintering using discrete element method</i>	021
16.00	B Song Cranfield University, UK <i>Using particle swarm optimisation (PSO) algorithm to optimise the mixed-model production problem in Flexible Manufacturing System</i>	042
16.20	Y Silvera, R Decoster & Conyefulu Brunel University, UK <i>Supply Chain Visibility: Critical or Not to the On-Time Delivery performance of SME Supply Chains?</i>	005
16.40	K.P Rajurkar University of Nebraska, Lincoln, USA <i>Experimental Investigation and Finite Element Analysis of Electro Discharge Drilling of PCD</i>	026
17.00	M Hossam ^{1,2} , A Harfoush ¹ ¹ Alexandria University, Egypt ² Egypt-Japan University of Science and Technology, Egypt <i>Modelling of a Robot-Arm Using Motion Capture</i>	044
17.20	T. Robinson, C. Armstrong, A. Murphy, J. Butterfield, M. Price Queen's University of Belfast, Belfast, UK <i>CAD modelling to enable an intelligent DMU</i>	023
17.40	CLOSE OF CONFERENCE SESSIONS AND CHAIRMAN PROFESSOR JOE MCGEOUGH'S REVIEW OF CAPE 23	

POSTERS

	<i>Ultrasonic Assisted Electrolyte Jet Machining for Surface Texture</i> Jonathon Mitchell-Smith ¹ , Adam Thompson ¹ , Nicola Senin ¹ , ² Richard K Leach ¹ Adam T Clare ¹ ¹ Institute for Advanced Manufacturing, University of Nottingham, Nottingham, UK, ² Department of Engineering, University of Perugia, Perugia, Italy	037
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THURSDAY 5 NOVEMBER

09.30	<i>INDUSTRIAL VISIT TO MacTAGGART SCOTT</i> <i>Departing and returning to Pollock Halls of Residence Reception area</i>	
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