

# Contents

The Institution of Electrical Engineers is not, as a body, responsible for the opinions expressed by individuals authors or speakers

Page No.

I **CHAIRMAN'S ADDRESS**

Professor D Hitchins  
Royal Military College of Science, UK

## **THE HCI DESIGN PROBLEM**

5 **'Integrating human factors with system development methods: An overview of a structured human factors method'**

K Y Lim, J B Long and N Silcock  
University College London, UK

11 **'An engineering view of the human interface'**

P H Dawson  
BT, UK

15 **'A domain analysis of air traffic management'**

J Dowell  
University College London, UK

## **UNDERSTANDING DECISIONS**

20 **'A realistic simulation of human decision making behaviour'**

J Holt, T Newman and J Luscombe  
BAeSEMA Ltd, UK  
G Mathieson  
Defence Research Agency, UK

25 **'The importance of fractal phenomena to information decision-action systems'**

R W Anthony and D G McBryde  
Institute for Defense Analyses, USA  
J T Dockery  
Dept of Defense, USA  
A E R Woodcock  
Synetics Corporation, USA

30 **'Methods for assessing tactical decisionmaking in battle'**

B Fehér  
Naval Command, Control and Ocean Surveillance Center, USA

# Contents

Page No.

35 **\*'The desktop strategist: analysis of the intellectual support requirements for executives'**  
P K M'Pherson  
MacPherson Systems Ltd, UK  
I C Henderson  
CentreBoard Ltd, UK

40 **\*'The mathematics of knowledge building'**  
M Tommasi  
ALCATEL Telettra, Italy

## **AVOIDING INFORMATION OVERLOAD**

45 **'Addressing operator errors in supervisory systems'**  
J F Meech  
British Aerospace Sowerby Research Centre, UK

49 **'The on-line vehicle scheduler'**  
J B Williamson  
Bolton Institute of Higher Education, UK

54 **'ECOS: A configurable multi-terabyte database supporting engineering and technical computing on the Sizewell 'B' Nuclear Power Station'**  
A N Fish  
SD-Scicon UK Ltd, UK  
F Binns  
Nuclear Electric plc, UK

58 **'Analysis of aircrew decision-making'**  
P D Morgan and C P Gibson  
SD-Scicon UK Ltd, UK

## **ORGANISATION AND DECISION**

64 **'The impact on the decision making process in organisations resulting from structural change in response to dynamic changing environments'**  
R W Stewart  
Kingston Polytechnic, UK

70 **'Modelling organisational complexity using the ORDIT framework'**  
D F Poulson  
HUSAT Research Institute, UK  
G Oswald  
MARI, UK  
J S Chudge and M R Strens  
University of Newcastle, UK

# Contents

Page No.

- 75 **'Qualitative judgemental forecasting methods for use in strategic decision making'**  
D D Clarke  
University of Nottingham, UK
- 80 **'A theory of C<sup>2</sup> organizations'**  
B M Sherwood-Jones, J Holt and N Ferguson  
BAeSEMA, UK  
C S Narborough-Hall and S D Brennen  
DRA Maritime Division, UK
- 85 **\*'Why the objectives of complex organisation must determine information-decision-action systems'**  
J Proffitt and J Bourne  
Dowty Maritime Command and Control Systems, UK
- 90 **\*'SSM as an aid to requirements definition'**  
G Paton  
Army CIS Agency, Blandford, UK

## **APPLYING TECHNOLOGY TO ENHANCE DECISION PERFORMANCE**

- 95 **'Decision support for energy management systems'**  
I E Hopley, T Holden and G P Wilhelmij  
University of Cambridge, UK
- 100 **'Comparing decision aids for technology transfers'**  
T H Murray  
Sequoia Associates Inc, USA
- 105 **'JOTS - A military C3D2 core operating system and development environment for distributed decisionmaking'**  
F P Engel  
Inter-National Research Institute, USA
- 110 **'An expert system to assist operators of the power system control centres'**  
Zita A Vale and A Machado e Moura  
Oporto University, Portugal
- 115 **\*'Database synchronisation in military command and control systems'**  
R J Ramsden  
Siemens Plessey Electronic Systems Ltd, UK

## **SPECIFYING IDA SYSTEMS REQUIREMENT**

- 118 **'Towards an analysis and specification method for IDA systems'**  
P J Byers and M K Wilkinson  
Smith Associates Limited, UK

# Contents

Page No.

- 123 **'User requirements capture and specification'**  
J F Dorrington  
Captain Naval Operational Command Systems, Portsmouth, UK  
C J Madams  
DRA Maritime Division, ARE Portsmouth, UK

- 128 **'It's not easy being a customer'**  
F R Albrow  
Ministry of Defence, UK  
T A D White  
Defence Research Agency, UK

## **PROTOTYPES AND SCALING UP TO FULL IDA SYSTEMS**

- 133 **'An ODP model for military IDA systems'**  
J A Bull  
Architecture Projects Management Ltd, UK  
J E Holmes  
DRA (Electronics and Maritime), UK

- 138 **'Interoperability problems – prevention is better than cure'**  
C J Rhodes and G B Wilson  
Ferranti Systems Integration, UK

- 143 **'How can the user get what he wants?'**  
J P Darbyshire and J D Watt  
Data Sciences UK Ltd, UK

- 149 **'A fully-featured human computer interface for intelligence and command & control applications'**  
S P Braim and N Hepworth  
DRA Electronics Division, UK

## **ADAPTING TO CHANGE**

- 153 **'An adaptable expert aid to fault diagnosis in satellite communication networks'**  
M B Green and P R Sims  
Siemens Plessey Defence Systems Ltd, UK

- 158 **'Adaptive computer support in future naval systems'**  
J Martin  
DRA Maritime Division, UK

- 164 **'Successful implementation of a knowledge based, smelter operations scheduling system at the Palabora Mine in South Africa'**  
G S Pauley  
RTZ ITSU, UK

# Contents

Page No.

## **PREDICTING/JUDGING IDA SYSTEM EFFECTIVENESS**

- 173 **'Requirements construction and the process of validation'**  
R Mihajlovic  
BT Laboratories, UK  
M Sweeney  
HUSAT Research Institute, UK
- 177 **'Alternative views of the quality of military plans'**  
M Colbert, J Dowell and J Long  
University College London, UK  
J B McCubbin  
MOD (NAVY), UK
- 182 **'A method to ensure that IT system designs meet operational performance requirements'**  
A P Fry  
Siemens Plessey Electronic Systems Ltd, UK
- 186 **'Accuracy and timeliness in developing a tactical picture'**  
S A K Zaidi and A H Levis  
George Mason University, USA
- 191 **'Combat system performance modelling tools and their use'**  
J Lowndes and M C Duggleby  
Ferranti Systems Integration, UK
- 196 **'A mission oriented approach to system development'**  
P Mallorie  
Private address, UK
- 209 **'Medial surface models of rational expected utility maximising decisionmaking (REDM)'**  
A E R Woodcock,  
Synetics Corporation, USA

\* indicates those papers not formally presented

# List of Authors

	Page No
Albrow, F R.....	128
Anthony, R W.....	25
Binns, F.....	54
Bourne, J.....	85
Braim, S P.....	149
Brennen, S D.....	80
Bull, J A.....	133
Byers, P J.....	118
Chudge, J S.....	70
Clarke, D D.....	75
Colbert, M.....	177
Darbyshire, J P.....	143
Dawson, P H.....	11
Dockery, J T.....	25
Dorrington, J F.....	123
Dowell, J.....	15/177
Duggleby, M C.....	191
Engel, F P.....	105
Fehér, B.....	30
Ferguson, N.....	80
Fish, A N.....	54
Fry, A P.....	182
Gibson, C P.....	58
Green, M B.....	153
Henderson, I C.....	35
Hepworth, N.....	149
Hitchins, D.....	1
Holden, T.....	95
Holmes, J E.....	133
Holt, J.....	20/80
Hopley, I E.....	95
Levis, A H.....	186
Lim, K Y.....	5
Long, J B.....	5/177
Lowndes, J.....	191
Luscombe, J.....	20
Machado e Moura, A.....	110

Madams, C J.....	123
Mallorie, P.....	196
Martin, J.....	158
Mathieson, G.....	20
McBryde, D G.....	25
McCubbin, J B.....	177
Meech, J F.....	45
Mihajlovic, R.....	173
Morgan, P D.....	58
M'Pherson, P K.....	35
Murray, T H.....	100
Narborough-Hall, C S.....	80
Newman, T.....	20
Oswald, G.....	70
Paton, G.....	90
Pauley, G S.....	164
Poulson, D F.....	70
Proffitt, J.....	85
Ramsden, R J.....	115
Rhodes, C J.....	138
Sherwood-Jones, B M.....	80
Silcock, N.....	5
Sims, P R.....	153
Stewart, R W.....	64
Strens, M R.....	70
Sweeney, M.....	173
Tommasi, M.....	40
Vale Zita, A.....	110
Watt, J D.....	143
White, T A D.....	128
Wilhelmij, G P.....	95
Wilkinson, M K.....	118
Williamson, J B.....	49
Wilson, G B.....	138
Woodcock, A E R.....	25/209
Zaidi, S A K.....	186