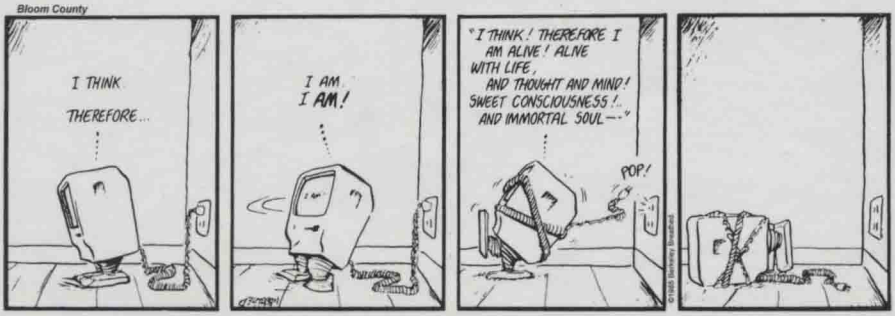
THE COMPUTER AFTER ME



Awareness and Self-Awareness in Autonomic Systems

Jeremy Pitt *editor*

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Jeremy Pitt

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Awareness and
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Preface

When I was much younger, my ambition was to be a science fiction writer. Fate, in whatever preposterous guises it could find, dealt me a hand in which I ended up as an academic, spending a lot of my time writing European project proposals. Some of these get funded, and become facts (of a sort); most of them don't, and remain, well, fictions. Live the dream, as they say.

However, the EU Future and Emerging Technology (FET) Unit warrants considerable approbation for its continued success in defining research programmes that could, with appropriately tinted spectacles, be reasonably construed as science fiction – but then funding research projects under that programme which turn the ostensible fictions into hard scientific fact.

One of these targeted programmes, or Proactive Initiatives, addressed *Awareness and Self-Awareness in Autonomic Systems*, ICT for optimising system performance based not so much on the designer's conceptions, but on the system's own perceptions (awareness) of its performance with respect to the dynamic environment in which it is presumed to be embedded.

This immediately raises a number of scientific challenges, not least because the notion of 'awareness' or the state of being 'self-aware' are hardly well defined or understood by those disciplines that have addressed them, let alone as new concepts for ICT.

Recognising that meeting such challenges therefore requires a coordinated, inter-disciplinary effort, FET also funded a Coordination Action (in our case, imaginatively entitled AWARE), whose remit is, *inter alia*, to foster cooperation and communication between the projects in the programme. Moreover, it has a responsibility to be outward-looking, to engage with both the scientific community and with EU citizens, in order to explain the motivation for the programme, and to explore the consequences if the targeted outcomes of the research programme were to be met.

This is the aim of the current volume: to map out the space of research in computational awareness, computational self-awareness, and autonomic systems; and to explore the possible social, political, cultural, legal and environmental ramifications.

On a more general note, the idea of the conscious and/or self-conscious machine has intrigued scientists and writers alike. However, this book is not about futurologist interpretations of Moore's Law and (wild?) projections about cyborgs, singularities and the revolution of the robots, however much fun that might be (and frankly the micro-chip in my recalcitrant toaster seems to have already made a start). It is, on the other hand, a realistic assessment of the state of the art in computational awareness and, in particular, a serious consideration of its potential for benefit and disruption. No technology is intrinsically 'good' or 'bad', it is only the use to which it is put – or programmed – or perhaps self-programmed – that can be judged in such a way. It is incumbent on responsible scientists and technologists to consider the social implications of their science and technology. It is all well enough for mountaineers to justify their actions by "because it is there", but not good enough for scientists to justify themselves by "because I can", and then shrug their shoulders at being taken by surprise by the Law of Unintended Consequences. Again.

Jeremy Pitt
London, 2014

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I have benefited enormously from the wonderful collegiality of all my collaborators on the Aware Project: Ben Paechter, Emma Hart, Callum Egan (who never misses an opportunity to make me look good), Ingi Helgason, Gusz Eiben, Mark Hoogendorn, Giacomo Cabri (who never knowingly under-invites me anywhere), Franco Zambonelli and Jennifer Willies. Thanks everyone; but a special thanks to Jennifer, none of this would be possible without her remarkable wisdom, sheer enthusiasm and indefatigable energy; and certainly not the proof that *compensation* $= \pi R(g\overline{g})^2$.

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Contents

Preface v

Acknowledgments vii

1. Introduction: The Computer After Me 1

Jeremy Pitt

1.1 Introduction 1
1.2 Computer Awareness in Science Fiction 4
1.3 Computer Awareness and Self-Awareness 6
1.3.1 How many senses does a computer have? 6
1.3.2 Does a computer know that it is a computer? . . 9
1.3.3 Does metal know when it is weakening? 11
1.4 Why Does Computer Awareness Matter? 13
1.5 Chapter Overviews 16
1.6 Summary and Conclusions 17

What Comes After the 'Disappeared Computer'? 19

2. Towards Self-Aware and Self-Composing Services 21

Giacomo Cabri and Franco Zambonelli

2.1 Introduction 21
2.2 Service Composition and Self-Awareness 22
2.2.1 Horizontal composition 23
2.2.2 Vertical composition 23
2.2.3 Towards self-aware services 24

2.3 Approaches to Self-Aware Service Composition 25
2.3.1 Nature-inspired self-composition approaches . . . 25
2.3.2 Composition and re-composition of service collaboration patterns 28
2.4 Research Challenges 33
2.4.1 Challenges for nature-inspired self-composition . . 33
2.4.2 Challenges for dynamic adaptation of system collaboration patterns 34
2.5 The Impact 35
2.6 Summary and Conclusions 36

3. Issues in Engineering Self-Aware and Self-Expressive Ensembles 37
Matthias Hölzl and Martin Wirsing

3.1 Introduction 37
3.2 Classifying Awareness and Self-Expression 39
3.2.1 Elements of the awareness mechanism 39
3.2.2 A white-box definition of awareness 40
3.2.3 Self-expression 44
3.2.4 A black-box definition of awareness 45
3.3 Awareness Engineering 46
3.4 Socio-Technical Issues 47
3.4.1 Privacy, ownership and control of data 47
3.4.2 Discrimination and responsibility 50
3.4.3 Failure modes 52
3.5 Summary and Conclusions 54

4. Social Awareness in Technical Systems 55
Christian Müller-Schloer, Mathias Pacher, Yvonne Bernard and Lukas Klejnowski

4.1 Introduction 55
4.2 Self-Governing Institutions 58
4.3 Technical Agent Societies 60
4.3.1 Trusted communities 60
4.3.2 The social agent 61
4.3.3 From implicit to explicit trusted communities . . 65
4.4 No Society without Rules 66
4.5 Outlook 69

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5. Self-Healing Software 71

Regina Frei and Giovanna Di Marzo Serugendo

5.1 Introduction 71
5.2 Self-Awareness as an Aspect of Self-Healing 72
5.3 A Working Taxonomy for Software Self-Healing 73
5.3.1 Failures, errors and faults 75
5.4 Approaches to Software Self-Healing 76
5.4.1 Self-healing at code level 77
5.4.2 Self-healing through self-organisation 79
5.4.3 Self-healing based on policies 79
5.4.4 Architectures for self-healing 80
5.4.5 Model-based solutions for self-healing 81
5.5 Discussion and Conclusion 82

6. Bring It On, Complexity! Present and Future of Self-Organising Middle-Out Abstraction 83

Sebastian von Mammen and Jan-Philipp Steghöfer

6.1 The Great Complexity Challenge 83
6.2 Self-Organising Middle-Out Abstraction 84
6.3 Optimising Graphics, Physics and Artificial Intelligence . 85
6.4 Emergence and Hierarchies in a Natural System 87
6.5 The Technical Concept of SOMO 89
6.5.1 Observation of interactions 89
6.5.2 Interaction pattern recognition and behavioural abstraction 91
6.5.3 Creating and adjusting hierarchies 92
6.5.4 Confidence measures 93
6.5.5 Execution model 95
6.5.6 Learning SOMO: parameters, knowledge propagation, and procreation 96
6.6 Current Implementations 98
6.7 Awareness Beyond Virtuality 99
6.7.1 Integration and emergence 100
6.7.2 Model inference 100
6.7.3 SOMO net 100
6.7.4 SOMO after me 101
6.8 The Future of SOMO 102

Is That Computer Out to Get Me? 103

7. Self-Steering and Aware Homes 105

Marco Aiello, Roberto Baldoni, Alexander Lazovik and Massimo Mecella

7.1 Introduction 105
7.2 The Many Contributions to the Home Context 107
7.2.1 The home context 107
7.2.2 A case study 108
7.3 A Smart Home Architecture 109
7.4 Discussion 112
7.5 The Future of Homes 115

8. Assistive Awareness in Smart Grids 117

Aikaterini Bourazeri, Pablo Almajano, Inmaculada Rodriguez and Maite Lopez-Sanchez

8.1 Introduction 117
8.2 Background 118
8.3 The User–Infrastructure Interface 119
8.4 User Engagement through Assistive Awareness 120
8.5 Research Impact 121
8.6 Serious Games for Smart Grids 122
8.7 Serious Game Technology 124
8.7.1 Game scenario 126
8.7.2 Game mechanics 126
8.8 Related Work 128
8.9 Summary and Conclusions 130

9. Norm-Aware Socio-Technical Systems 131

Bastin Tony Roy Savarimuthu and Aditya Ghose

9.1 Introduction 131
9.2 The Need for Norm-Aware Systems 133
9.2.1 Norms in human societies 133
9.2.2 Why should software systems be norm-aware? . . 134
9.3 Case Studies of Norm-Aware Socio-Technical Systems . . 135
9.3.1 Human–computer interactions 135
9.3.2 Virtual environments and multi-player online games 136

9.3.3 Extracting norms from big data and software repositories . . . 136
9.4 Norms and Sustainability . . . 138
9.4.1 Sustainability and green ICT . . . 138
9.4.2 Norm awareness through software systems . . . 139
9.5 Where To, From Here? . . . 145
9.6 Conclusions . . . 146

10. Interactive Design Activism 147

Petar Goulev and Joan Farrer

10.1 Introduction . . . 147
10.2 Computers and Human Well-being . . . 149
10.3 To Fuzzy or Yes (No)! . . . 150
10.4 Interactive Design Activism . . . 152
10.5 Sensing the Sun . . . 153
10.6 Personalised Public Health Advice . . . 155
10.7 Modifying Human Behaviour . . . 156
10.8 Transdisciplinarity, Knowledge Transfer and Multi-domain 157

11. The Social Computer 159

Giovanna Di Marzo Serugendo, Matteo Risoldi and Mohammad Solemayni

11.1 Introduction . . . 159
11.2 Problem and Research Questions . . . 160
11.3 State of the Art . . . 162
11.4 TSC Structure and Computational Awareness . . . 166
11.5 Methodology and Research Directions . . . 168
11.6 Case Study: Democracy . . . 170
11.7 Conclusions . . . 172

12. Collective Awareness and the New Institution Science 173

Jeremy Pitt and Andrzej Nowak

12.1 Introduction . . . 173
12.2 Challenges for Institutions . . . 174
12.3 Collective Awareness . . . 176
12.4 A New Science of Institutions . . . 177
12.4.1 Complex social ensembles . . . 178

12.4.2 Interoceptive collective awareness 179
12.4.3 Planned emergence 179
12.4.4 Self-organising electronic institutions 181
12.5 Transformative Impact on Society 182
12.5.1 Social attitudes and processes 182
12.5.2 Innovative service creation and social innovation . 183
12.5.3 Scientific impact 184
12.5.4 Big data 185
12.5.5 Self-regulation 186
12.6 Summary and Conclusions 187

13. Be Vigilant: There Are Limits to Veillance 189

Katina Michael, M. G. Michael and Christine Perakslis

13.1 Introduction 189
13.2 From Fixed to Mobile Sensors 190
13.3 People as Sensors 192
13.4 Enter the Veillances 195
13.4.1 Surveillance 196
13.4.2 Dataveillance 196
13.4.3 Sousveillance 196
13.4.4 Überveillance 197
13.5 Colliding Principles 198
13.5.1 From 'drone view' to 'person view' 198
13.5.2 Transparency and open data 199
13.5.3 Surveillance, listening devices and the law 199
13.5.4 Ethics and values 199
13.5.5 The unintended side effects of lifelogging 201
13.5.6 Pebbles and shells 202
13.5.7 When bad is good 202
13.5.8 Censorship 203
13.6 Summary and Conclusions: Mind/Body Distinction . . . 204

The Engineers of Computer Souls? 205

14. Robotic Self-Modeling 207

Justin W. Hart and Brian Scassellati

14.1 Introduction 207

14.2 A Model of the Self 208
14.3 Nico, a Self-Modeling Robot 209
14.4 A Kinematic–Visual Self-Model 212
14.4.1 Learning the self-model 213
14.4.2 Tool use 214
14.4.3 Instrumental mirror use 216
14.4.4 Nico's self-model, in a nutshell 217
14.5 Impact, Summary and Conclusions 217

15. Reflective Systems Are a Good Step Towards Aware Systems 219

Kirstie L. Bellman

15.1 Expectations for Self-Aware Systems 219
15.2 Towards Self-Aware Systems: Computational Awareness . 221
15.3 Wrappings: Implementing Computational Reflection . . . 224
15.4 An Example of Wrappings: CalPoly CARS Testbed . . . 228
15.5 The Challenges Ahead 231
15.6 Summary and Conclusions 235

16. Robots with Internal Models: A Route to Self-Aware and Hence Safer Robots 237

Alan F. T. Winfield

16.1 Introduction 237
16.2 Internal Models and Self-Awareness 238
16.3 Internal Model-Based Architecture for Robot Safety . . . 240
16.3.1 The Internal Model 241
16.3.2 The Consequence Evaluator 242
16.3.3 The Object Tracker-Localizer 244
16.4 Towards an Ethical Robot 245
16.5 Challenges and Open Questions 247
16.6 Discussion: The Way Forward 250
16.7 Summary and Conclusions 252

17. Awareness and Responsibility in Autonomous Weapons Systems 253

Nehal Bhuta, Antonino Rotolo and Giovanni Sartor

17.1 Introduction 253
17.2 Why Computational Awareness is Important in Autonomous Weapons 254

17.3 Flying Drones and Other Autonomous Weapons 258
17.4 The Impact of Autonomous Weapons Systems 260
17.5 From Autonomy to Awareness: A Perspective from Science Fiction 262
17.6 Summary and Conclusions 264

18. Computational Self-Awareness and Learning Machines 267

Peter R. Lewis

18.1 Introduction 267
18.2 Computers in Search of Knowledge 268
18.3 Types of Computational Self-Awareness 272
18.4 The Outlook for Computational Self-Awareness 278
18.4.1 Perspectives 278
18.4.2 Outlook 279

Bibliography 281

Index 309

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