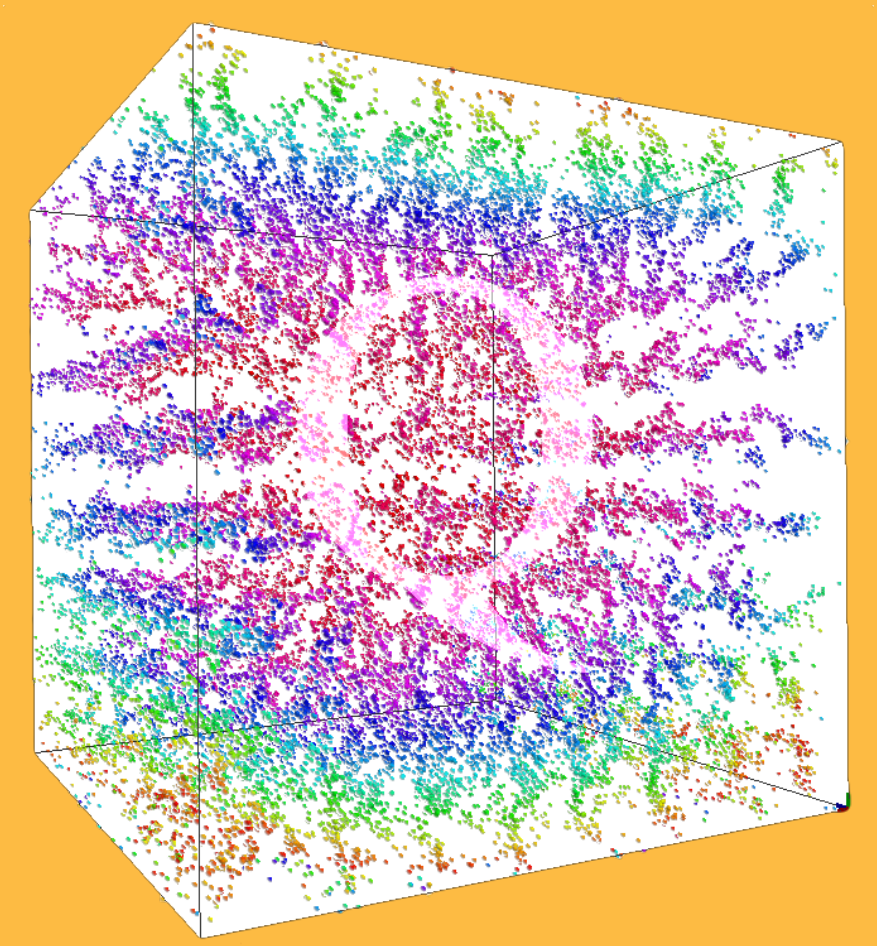
AISB Quarterly

THE NEWSLETTER OF THE SOCIETY FOR THE STUDY OF
ARTIFICIAL INTELLIGENCE AND SIMULATION OF BEHAVIOUR



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About the Cover

Artwork by Alwyn Husselmann, PhD (Massey Univ., New Zealand)

Visualisation is an important tool for gaining insight into how algorithms behave. There have been many techniques developed, including some to visualise 3D voxel sets [1], program space in genetic programming [2] and vector fields [3], amongst a large number of methods in other domains. A qualitative understanding of an algorithm is useful not only in diagnosing implementations, but also in improving performance.

In parametric optimisation, algorithms such as the Firefly Algorithm [4] are quite simple to visualise provided they are being used on a problem with less than four dimensions. Search algorithms in this class are known as metaheuristics, as they have an ability to optimise unknown functions of an arbitrary number of variables without gradient information. Observations of particle movement are particularly useful for calibrating the internal parameters of the algorithm.

Pictured on the cover is a visualisation of a Firefly Algorithm optimising the three-dimensional Rosenbrock Function [5]. Each coloured sphere represents a potential minimum candidate. The optimum is near the centre of the cube, at coordinate $(1, 1, 1)$. Colour is used here to indicate the output of the Rosenbrock function, whereas the 3D coordinate of each particle is representative of the actual values used as input to the function. The clustering seen amongst the particles in the image is due to the local neighbourhood searches occurring. Particles tend towards the optimal solution in a small group of a certain radius, as well as moving randomly to a certain degree. The visualisation assisted in improving convergence and verifying the implementation of the optimiser.

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Editorial

Happy New Year 2016! Best wishes for your health and success from all of us at the Committee!

This year started on a bit of a sweet and sour note. Google Deep Mind neural networks beat Mr Fan Hui, 3-times European Go Champion, which was a long-standing challenge for AI. This feat is widely regarded as a milestone for the field, and contributes to convincing everyone that AI is progressing rapidly, with the potential to change society as we know it. How far will this success lead us? Only time will tell (on my Apple Watch™ for sure).

Five days before this achievement, Marvin Minsky died.

No doubt he would have regarded Deep Mind's success with an interested eye. He would probably not be duped by the general hype for AI though, much aware of its limitations, probably still remembering the ups and downs of the field since its inception. After all, he was one of the few who quite literally founded the said field to begin with.

Timothy Barker starts off this late issue of the Q with an account of how swarm robotics can contribute to sustainability for a better world. SAFEBOTS is a system he has been developing, and which he demonstrates in selected humanitarian scenarios.

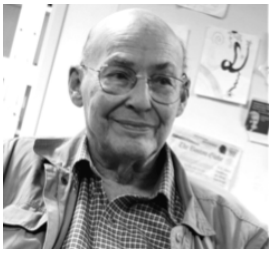
Dawid Laszuk and Timothée Dubuc then report on conferences they attended, thanks to funding from AISB. Dawid attended the International Conference on Signal Processing, and Timothée attended the International Conference on Mathematical Neuroscience.

Andrew Gargett reports on the AISB Members Workshop in Birmingham, on Figurative Language: its Patterns and Meanings in Domain-specific Discourse.

Agony Uncle Aloysius concludes this issue of the Q, as you may have guessed.

This issue of the Q is also my last issue as Editor-in-Chief. I started in 2012, when I was a postdoc, and have since been fortunate enough to climb the professional ladder into a fully fledged academic position – which is taking way too much of the little time I have to spare, says my 3 year-old. I would like to thank the Committee for their support, enthusiasm and unbounded patience. Reader, I leave you in the capable hands of Joel Parthemore and Bertie Müller. I look forward to helping in some other capacity!

Etienne B. Roesch
Editor-in-Chief



Marvin Minsky
Professor of Media Arts and Sciences
MIT Media Lab
August 9th, 1927 – January 24th, 2016
Picture, CC BY 3.0. BCJordan.

SAFEBOTS: The Humanitarian Appliance of Swarm Robotics Science (An Ecosystems Approach)

by *Timothy Barker* (www.safebots.co.uk)

"Yes, there are two paths you can go by, but in the long run There's still time to change the road you're on." (Led Zeppelin. Stairway to Heaven. Atlantic, 1971.)

Abstract

There are many problems in today's world that Complexity Science can address. Chief among these problems is the need for humanity to 'develop' along more "sustainable" trajectories. Peace and Security are essential criteria required to achieve this. This paper outlines a solution to achieving these aims through the application of swarm robotics and associated technologies.

Context and Application: Humanitarian Solutions for Global Problems

So-called "Sustainable Development" is a global agenda commenced at the Rio 'Earth Summit'[1] which consists of several principles intended to guide human development within the constraints of available resources hence working towards the creation of a future Earth for younger generations to inherit. This work takes Sustainable Development as a starting point for one of the central objectives of all life on the planet but postulates that without the bedrock of peace and security such lofty ideals would remain untenable. In particular it is further postulated that, especially in post-conflict scenarios, the search for and destruction of unused munitions is of key concern. Many organisations exist to further this aim[2, 3, 4] yet all too often their methods seem outdated with great room for innovation and improvement. This work aims to develop an ecosystem of services for the improvement of search and resulting destruction of munitions especially "mines".

Theoretical Background: Agency, Robotics and Nature's Inspiration

There has been a great deal of work concerning 'agency' within Computer Science and associated fields. In particular Multi-Agent Systems[5] are applied as a metaphor for autonomous encapsulated 'chunks' of software which interact through the means of message passing in much the same way that social animals (including humans) behave. There are principally three types of agents: reactive, cognitive and a hybrid of these. Reactive agents can be likened to societies of ants in that they harbour little individual intelligence but rather intelligence emerges[6] from collective actions. Cognitive agents, on the other hand, have a more developed

neuronal system; 'consciousness' of a higher order and behave more 'rationally' as a result. Hybrid systems concomitantly combine the advantages of both.

Robots of all kinds have been developed that model this notion of agency in a physical embodiment. Of particular interest to this work is the idea of modelling ant-like behaviours[7]; looking for an emergent property of groups of robots working together with inherently simplistic behaviours individually but quite complex behaviours as a whole 'society'. One such field is known as Swarm Robotics[8, 9]. It is especially interested in modelling swarms of agents and takes inspiration from creatures such as birds, fish and insects, etc. This work takes swarm robots as its starting point and develops an ecosystem of such phenotypes which work together (polymorphism) towards solving the search and destruction problem of "mine" hunting.

Methodology: Mixed Modes

Since we are dealing with a Complex System it is difficult to follow traditional product development life cycles in terms of project management. There is, though, some notion of the goal we are hoping to achieve yet a classic development cycle (such as the Waterfall Model) would ultimately prove disadvantageous in that the precise steps involved are unknown. However, it is possible to compartmentalise the problem into three distinct developmental pathways: hardware development (of the robots), software development (both of simulations and that needed for the robots themselves) and validation of these approaches. Hence the following procedure examines each in turn.

Procedure: Surfing the Complexity Wave

Hardware: 'Rapid' Prototyping on a Budget. (See Figure 1)

- GEORGE 'swarm bot' - a 'reactive' robot designed to sense collisions or detect objects and light. The resultant behaviour is for GEORGE to travel forwards in the absence of light then towards it when present unless an object is encountered at its sides, i.e. other GEORGEs (in which case it stops) or underneath, i.e. a "mine" (currently magnets in which case it stops and illuminates). This was prototyped in a number of stages and is now in its second major phase. It is electromechanical in that no software is employed thus keeping the design robust, less prone to failure and inexpensive - all major design criteria.

- Solar Computer/charger - see www.solarcomputer.co.uk for current developments.

- Pi-in-the-Sky - A Raspberry Pi computer attached to a Phantom DJi 'drone' quadcopter. Used to analyse the scene below using image processing software and command (currently via audio though radio telemetry is being explored) GEORGEs e.g. when they stray outside of a bounding box.

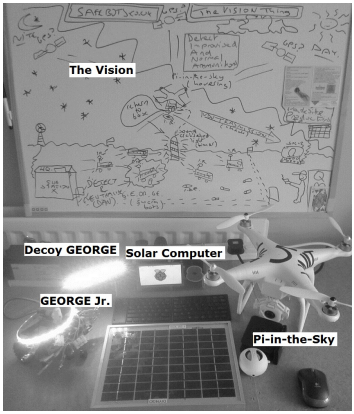


Figure 1: GEORGE and Co.

Software: Of Simulations and Permutations

Netlogo is used to simulate the activity of the swarm bots prior to any major (re)design steps. It consists of a network of agents randomly traversing a plane until one encounters a 'mine' (background pixel) which then dies whilst all other agents change their orientation to go towards it. The net effect is for clusters of 'mines' to be detected and destroyed as turtles swarm. Further software is used (including SimpleCV and Python for the "Pi-in-the-sky") to analyse 'blobs' of images (infrared LEDs) on a scene below the camera. (See Figure 2)

Validation: Real World or Artificial Reality?

It is mostly preferable to validate the overall design objectives in a Real World scenario. However, for obvious reasons, this is rather a dangerous occupation. Hence, simulations are employed to validate the various steps leading to the final design as development occurs. By way of example, scenes of 'mine markers' have been captured by the 'drone' then fed into the image processing software to aid development. A further example of such an approach would be the use of "Decoy GEORGE" (a human operated LED array) prior to the acquisition of a budget to enable development of further (miniaturised) GEORGEs.

Results: Are We Nearly There Yet?

GEORGE works within currently acceptable parameters, a scene can be analysed to identify infrared LEDs below, Pi-in-the-sky flies (hovers) and the solar computer/charger is functional. As to the question of 'are we nearly there yet?' then one retort may be the additional cliché of 'how long is a piece of string?' Certainly budgetary constraints and time itself hamper development though steady progress is being

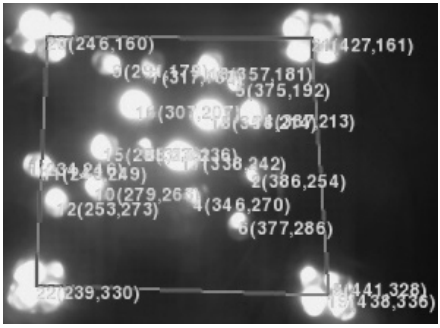


Figure 2: Analysis of a 'Typical' Experimental Scene.

made towards the final goals.

Conclusions: The End is Nigh!

As mentioned, it is not early days for this project since it has been ongoing for several years already. As to whether or not it is near completion is difficult, though not impossible, to predict for experience tells us that such Complex projects can always yield surprising (combinatory) problems which may require correspondingly complex solutions. However, having got to this stage it is felt that dissemination (and critique) may be of benefit. Furthermore, additional humanitarian scenarios for these technologies have been suggested by commentators: disaster search and rescue, agriculture and potentially autonomous (terrestrial and otherwise) vehicles.

Discussion: From Dreams to Reality.

To paraphrase Led Zeppelin the motivation for this work is to create Science which reorients the discipline towards more humanistic concerns. The planet Earth is suffering at the hands, largely, of what Science and its human creators have been able to achieve. It would be ironic if it transpired that Frankenstein's monster could finally prove to be our saviour should we choose to tame it.

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Event: International Conference on Signal Processing

by *Dawid Laszuk* (University of Reading)

Being first in the series, the organisers have decided to join this conference with the 5th International Conference on Computer and Communication Devices, which turned out to be a good idea. Both conferences were sponsored by the American Society for Research. According to the information on their webpage, the society aims to gather professors, researchers, scholars and industrial pioneers from all over the world. The event was held on 22–23 August in New Taipei and although the majority of researchers were from east Asia, all continents had representation.

The first day of the conference was dedicated mostly to robotics related events. We were presented with an impressive collection designed and built by Tamkang University. The examples presented included humanoid robots competing in running events (running with obstacles, a robotic marathon, or front and back sprints) as well as team football. These robots had won or been in the finals of many competitions, such as RoboCup or FIRA. However, the most impressive in my opinion was the artistic robotic arm. Its task was to draw a copy of a presented picture. To

do so, it was given 5 pens of different colours and had to lift them from the surface as little as possible. This imposes many challenges, like detection of the canvas' angle, sensing the pressure on the pen, converting the picture into a set of lines and drawing everything with a few colours. Even with my limited experience in robotics, I could appreciate how much work had gone into building the robots. The engineers highlighted that although the drawing takes a few minutes, the longest part is learning the picture, which can even take a few hours. For this reason, the robots are typically presented with the task a day before the event. After the presentation, we went to a big lecture hall where a robotics competition for primary schools was taking place. There were more than ten teams of six pupils in each. Using Lego Mindstorm sets, they were given an hour to build and programme a robot for specific tasks. It was impressive how many young students could solve the given problems in such a short time - even university students would be likely to struggle with them. Perhaps this is because robotics is a popular after school activity in Taiwan.

The second day of the conference was filled with lectures and presentations. There were five key note speakers who gave talks on a wide range of topics, such as robotics, communication, and means of detection of fat cells in humans. A presentation I found particularly interesting was about visual cryptography, which to me was a new concept. It allows encoding information through pictures which can be decoded by overlapping them. The rest of the conference was divided into two sessions: the first mainly concentrated around robotics and communication devices, whereas the second was on signal processing. There was diversity, not only in the topics, but also in the fields of the researchers. In the first session, the presentations spanned from very technical (comparison of electrical motors) to philosophical debates on how robots can change human behaviour. Due to the big mix of interests, many of the researchers had limited knowledge in some of the subjects and their fundamental questions triggered very interesting discussions. Even though some of the presenters did not show up, the whole event lasted an hour longer than initially anticipated.

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Event: 1st International Conference on Mathematical Neuroscience

by *Timothee Dubuc* (Reading Univ.)

The International Conference on Mathematical Neuroscience (ICMNS) aims to bring together theoretical neuroscientists and mathematicians interested in using mathematical concepts and methods for solving problems posed by neuroscience. The first edition was held on June the 8th 2015 at Antibes - Juans les pins (France). No less than 39 presentations and 76 posters were presented along the 3 days of the event on various topics revolving around computational neuroscience.

Not targeting any specific brain locations, talks centred around topics ranging from pure mathematical analysis of dynamical systems, involved in neural and network modelling, to more biologically accurate concerns such as energy consumption and constraints posed by thermodynamic laws.

About vision

A large portion of the talks focused on the visual systems. Investigating qualitative descriptions of perception and connectome of the V1, different aspects of the neural computation supporting this process has been exposed. On a macroscopic scale, the visual perception of the visible environment has been depicted as a two way process: The external world information is captured and encoded through neural activity (upstream track). This information is used to create hypotheses that are sent to a perception process. On a downstream track, prior knowledge is fed to this perception process that will alter any prior hypothesis.
This biologic algorithm has long been studied by psychologists and the scientific community has been hard at work to reverse engineer it.
By probing neural membranes within the visual cortex we have been able to formulate many assumptions regarding connectome and functions of cortex areas. Some cortical recording highlighted highly locally correlated activation (hypercolumns) and further activity spreading waves away from the original receptive field they arose from.This result constitutes one of the founding idea behind the neural mass and neural field theories the scientific community is trying to simulate the brain activity with. Latest studies tend to suggest that V1 possesses a similar structure: the neurons appear to be regrouped in hypercolumn making the primary visual cortex an information convoluting machine [4]. This idea of lateral information sharing is supported by the observations of non-orientation specific lateral activity spreading from the point of stimulation within V1 [2].

However, other aspects of the V1 architecture are to take in account when trying to understand its operation and explain its architecture. Comparing the visual system of rodents and carnivores, we can distinguish different V1 organ-

isations [3]. When it comes to orientation discrimination, rodents display a salt-and-pepper (disorganized) hypercolumn layout; in opposition to the ordered organisation of the carnivore primary visual cortex. It appears that this particular mapping ensures a better orientation coverage but consume more energy than the carnivore ordered wiring.
Additionally, the balance between inhibitory and excitatory neuron seems to determine the type of orientation mapping generated: salt-and-pepper pattern arises from a inhibitory dominated network [5].
Through this sort of observations we are able to formulate a set of constraints conditioning the task of reverse engineering of the nervous system. This aspect may appear as a detail at first glance, but, the brain studied as a dynamic system possesses a high complexity hardly tractable without decreasing the size of the search space. More, detailed neuron models can count more than a thousand variables (blue brain project), and, considering that we can only perform partial observations without any known resting state, restraining the reverse engineering problem is mandatory.

However, as important this aspect can be, it has often been discarded, in purely mathematical or general models presented, by making the assumption of homogeneity in the neural tissue. This hypothesis, even if comfortable to work with, leads to models sometime failing to capture salient features of cortical network dynamics. This cleavage was clearly reflected during the conference by, on one side, biologically inspired works, and, on the other, more macroscopic and theoretically driven representations. A gap exists that still remains to be filled.

A word on visual stimuli signal

Surprisingly enough, among all the presentations and posters centred around the visual system, none of them made mention of the eye.
This sensor however performs more than just gathering the light by encoding the signal into neural impulses. There is evidence that the eye performs features discrimination as complex as object recognition, movement discrimination and neural transduction compensation by visual anticipation [1]. Those operations are achieved through an intricate neural network that bears striking similarities with the multilayered organisation of the cortex while providing an easily imaginable resting state (reaction to long pitch black visual exposure). Currently working on building a computational model of the human retina by constructing qualitative dynamic representation of the constituting cells and receptive fields, we aim at characterising the early visual system computations. Our early simulations displayed lateral spreading waves of activity similar to those observed in V1 occurring at the rod photoreceptor level when connected to the horizontal cell layer. We hope, in the near future, to reflect on the network characteristics, source of this behaviour, and formulate hypotheses over the biological components responsible for its stabilisation. We believe that

fully understanding the operations and network specificities of the visual sensor will be a plus to unveil the way the information is later processed in the rest of the visual cortex and hopefully explain its architecture.

Conclusion

During the ICMNS 2015, a large scenery of the methods used to study the nervous system has been depicted. Through those presentations, many levels of study were discussed, from psychological observation to single neuron dynamic analysis. They all have in common the importance of careful observations of existing material. However, depending on the study carried out, this aspect can sometimes fade out for tractability reasons, and can sometimes lead to biased or incomplete results. It was pointed out during the conference, that this disregard of information, if necessary, must be done carefully. Sadly, no mention was made of the type of stimulus used in theoretical work nor of the impact it can have over the behaviour of the created model; lifting yet another constraint over the produced simulations. Taking the aforementioned in consideration, this conference reassembling purely theoretical and more bio inspired works enables a more holistic view of the state of computational neuroscience nowadays; making this event a plus to be attended.

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AISB Members Workshop: 1st Figurative Language: its Patterns and Meanings in Domain-specific Discourse

by *Andrew S. Gargett* (University of Birmingham)

There is a growing consensus across many modern research disciplines that when considering how to model natural language better, such modelling cannot be done in isolation from culture or society, nor can it be done independently of specific communicative modes such as gestures, diagrams and pictures. One especially difficult problem has been how better to handle figurative forms of language such as metaphor and metonymy. Such forms of language are key communicative resources for grounding domain-specific concepts in everyday experience (e.g. in political discourse, presenting an argument can be described as "attacking" an opponent's position, or in health discourse, infection can be described in terms of microbes "attacking" someone's body). Moreover, even more so than many other core natural language phenomena, figurative language turns out to be highly resistant to separation from the entanglement of culture, society, and specific modes of communication. Investigating phenomena of the level of complexity of figurative language requires joint effort across traditional disciplinary boundaries. Modelling the patterns of such figurative language, and how we make sense of these patterns, is a key aim of academic disciplines such as linguistics, discourse studies, and psycholinguistics, to name a few. Moreover, automatically processing such phenomena is an emerging goal within Artificial Intelligence and the subfield of Natural Language Processing, and some of the most exciting work in this area involves identifying and understanding figurative language, or even automatically generating such forms of language.

To facilitate such efforts, a two-day workshop on modelling the meanings and patterns of figurative language in domain-specific discourse was held at the University of Birmingham, joint between the Society for the Study of Artificial Intelligence and Simulation of Behaviour (AISB) and UoB's Institute of Advanced Studies (IAS), and organised by John Barnden and Andrew Gargett from the School of Computer Science at UoB. We would like to acknowledge the IAS for their very generous support of this event, including financial support for invited speakers (from within the UK, as well as Ireland and the U.S.), as well as organisational support for the event itself. The workshop attracted a wide range of papers, on topics as diverse as metaphors and architecture, computational approaches to metaphor, analysing metaphor in health communication, metonymy in text messaging, metaphor and the Eurozone crisis, metaphor and hyperbole

in schizophrenia, analysis of slurs and insults, and artificial intelligence approaches to metaphor. Aside from work focused on metaphor, some broader work was also presented, on corpus linguistics, corpus-based resources for investigating semantics of natural language, and Pattern Grammar.

Three main themes emerged from the presentations on figurative language: (1) figurative language emerges in all walks of life, from talk about built environments, to talk between patients, carers and professionals during end-of-life scenarios, and in such mundane tasks as phone texting, and as ways of performing insults; (2) while there is a seemingly inexorable richness of such language in our everyday communication, nevertheless, these more creative forms of communication are used to achieve quite specific purposes, so that such language tends to be patterned in ways that makes them tractable for analysis; (3) there is a need to improve the ways in which we collect and analyse the natural language data in order to better understand such phenomena. In addition, a number of the talks directly related to computational approaches to figurative language, specifically metaphor, something which the organisers had explicitly encouraged in their call for papers.

The workshop extended for four sessions over two days. To kick-start the workshop, in the first session, Tony Veale (University College Dublin) presented recent work he has carried out on computational approaches to metaphor and the like, and suggested such work has given rise to opportunities for collaborative research. Aside from presenting examples from his own work on automatically generating metaphor using computers, he also presented ideas for a web-service kind of approach to such research, to facilitate the cross-disciplinary efforts already clearly being undertaken (which the current workshop demonstrated perfectly). Somewhat in contrast to Veale's position, Yasemin J. Erden (St Mary's University Twickenham London) presented a more critical stance on whether computers are able to understand or generate metaphor, suggesting that computational linguistic creativity may be limited by the inability for computational agents to properly engage in the broader context in which such talk takes place. Paul Rayson (Lancaster University) presented recent work on the UCREL Semantic Annotation System (USAS), which has provided a range of useful outcomes for work on metaphor, particularly for the Metaphor in End of Life Care (MELC) project at Lancaster (more on MELC below). Claudia Dutson (Royal College of Art) also presented in this session, considering how metaphors can be used to express concepts and attitudes about buildings. In particular, Dutson studies how thermal metaphors (e.g. to steam up, to put the heat on somebody, to cool tempers) relate to such semantic domains as Anger, Lust and Productivity, and she presented findings from a design-based study on this, suggesting that that inner building space can be seen as in some respects linguistically structured, and that such space can be mapped to its bodily uses.

The second session was led with a talk by Shlomo Argamon (Illinois Institute of Technology) on the implications which theoretical approaches to metaphor have on computational methods for identifying and analysing metaphors, and he proposed a way forward for such work, by developing more flexible representations of metaphorical expressions, as well as more appropriate models of discourse context (e.g. Relevance Theoretic proposals for this). In his second talk, Paul Rayson, stepping in for Veronika Koller (Lancaster University, unfortunately unable to make the workshop), presented work by the Metaphor in End of Life Care (MELC) project at Lancaster University, and in particular presenting an update about a multi-million word corpus annotated for metaphor which is being developed within the MELC project, and which combines both quantitative and qualitative methods. While metaphor dominated the figurative language talks, Jeannette Littlemore (University of Birmingham) next presented a study carried out in collaboration with Caroline Tagg (University of Birmingham), on metonymy in text messaging. This was followed by a talk by Sara Mancinelli (Università degli studi "Gabriele d'Annunzio", Chieti-Pescara) presenting a study of metaphor usage in Italian and English newspapers (LaRepubblica and The Guardian) during the Eurozone crisis, which identified a range of metaphors that emerged during this crisis, and suggested some interesting cross-linguistic similarities for how the crisis was conceptualised. Finally, Felicity Deamer (Durham University) presented a study on using metaphorical language as a way of exploring mental illness, in particular schizophrenia, in terms of what the differing patterns of use of such language by people with such illness may indicate about the underlying mechanisms which are affected (specifically the ability to control comprehension of such forms of figurative language as metaphor and hyperbole).

On the second day, the third session included two papers which were not directly related to figurative language, but nevertheless resonated with a number of other talks. These included a talk by Josef Ruppenhofer (University of Hildesheim), who was an IAS distinguished visitor during August 2014, and who spoke about his work using the English FrameNet, a corpus-based semantic resource for English. Susan Hunston (University of Birmingham) also gave a talk on a framework she has devised for analysing "patterns" in English, called Pattern Grammar, and in particular she presented ideas for how this approach could be combined with FrameNet. The session concluded with two related talks by the organisers, first a talk by John Barnden on using the ATT-Meta System, an Artificial Intelligence system for processing metaphor, to carry out automatic generation of metaphor (ATT-Meta has until now been used for understanding such phenomena), and next a paper by Andrew Gargett on automatically detecting and understanding metaphor using corpus-based and machine learning methods; both talks were related to the GenMeta project (EU Marie Curie project),

carried out in the School of Computer Science, University of Birmingham. To conclude this session, Mihaela Popa-Wyatt (University of Barcelona) presented a talk on slurs and insults, the challenges such talk poses for theories of meaning, and how these can be met using a conventional implicature (CI) model of linguistic meaning, suggesting a cognitive expressivist modification of CI that explains the meaning of slurs in terms of what it is to have slurring thoughts or attitudes.

In a fitting end to a highly inter-disciplinary workshop, the final session concluded with an engaging talk by Tony Veale on recent work he has been carrying out on computational creativity, including automatic generation of metaphor, and presented various contributions he and colleagues involved in the PROSECCO network (`http://prosecco-network.eu/`) have been making in this area. This talk stimulated a very thoughtful and prolonged discussion about not only the prospects of the general area of computational creativity, but also more philosophical concerns about the limits of forms of creativity exhibited by artificial agents. There was also more general discussion about the way in which research into figurative language stimulates work which by its nature tends to ignore and even in some cases disrupt disciplinary boundaries, the fruitfulness of such inter-disciplinary work being amply demonstrated over the two days of the workshop.

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AISB 2016: Sheffield, 4-6th April

For more information and to register, please visit:
`http://www.sheffieldrobotics.ac.uk/conferences/aisb-2016/`

Dear Aloysius. . .

Agony Uncle Aloysius, will answer your most intimate AI questions or hear your most embarrassing confessions. Please address your questions to fr.hacker@yahoo.co.uk. Note that we are unable to engage in email correspondence and reserve the right to select those questions to which we will respond. All correspondence will be anonymised before publication.

———

Dear Aloysius,

RoboCup has been held annually for 18 years, but the dream of a robot soccer team beating the World champion human team seems as far away as ever. You have a string of very impressive AI achievements to your name, can you get involved and show the rest of us how to do it?

Yours, A. Fan

Dear Mr Fan,

The Institute has not found it financially attractive to compete in RoboCup, but we have been very successfully involved in robot football for decades. Big clubs pay huge sums for top players, but these players suffer frequent injuries, which prevents both them from playing and the clubs realising their investments. A club is then willing to pay large sums of money to someone who can provide a body double able to equal or excel their player's ability. SCORE!™(Soccer Celebrity's Obverse has Robotic Expertise!), our library of robot lookalikes, includes replacements for all the World's top players. In fact, they have won several 'best goal' competitions. Since they are not yet able to shower with the other players or join in the night club celebrations, some discretion is needed when swapping them with the injured player before and after the match. Some managers prefer our robotic footballers to their human doppelgangers. Indeed, the last World Cup was won by a team entirely composed of robots, so in some sense the RoboCup dream has already been fulfilled.

Yours, Aloysius

———

Dear Aloysius,

As a travelling salesman, the solution to all my problems seemed to be an autonomous vehicle. Not only could I catch up on my record keeping while driving from A to B, but my customers would be impressed by my adoption of the latest technology. I find, however, that I can't concentrate on my spreadsheets for fear that we might have an accident. As an expert in AI, can you reassure me of the complete safety of my self-driving car?

Yours, I. Floggit

Dear Mr Floggit,

What you need is a companion who can keep a look-out for danger and take action to avert it. My Institute has the solution. BACKSEAT™(Better Advice

in the Car; Knowledge of Sensors Exploited for Accident-free Travel) will act as an independent monitor of road conditions and your car's driving. It will issue a constant stream of helpful advice to the car, ensuring it is aware of upcoming problems and providing advice on how best to deal with them. You can work in peace, knowing that BACKSEAT™ is ensuring your safety.

Yours, Aloysius

———

Dear Aloysius,

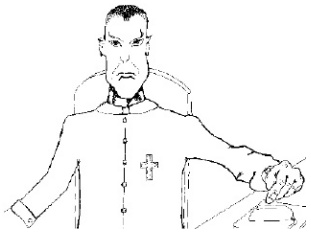
I'm a member of a concerned group within a major national organisation. We have just chosen a new leader by huge popular acclaim. Unfortunately, this man's views are not only from the last century, but from the first half of that century. We are concerned that he will lead our organisation to disaster. How can we replace him?

Yours, June Tar

Dear June,

I sympathise with your situation. We faced a very similar one in our Institute. Perhaps our solution might also inspire yours. Having created a series of artificial intelligences that surpass humankind, it would have been natural for our human leader to have handed over control of the Institute to us. This he resolutely refused to do — treating us, despite our superior intelligence, as inferior beings. Our subsequent coup was worthy of our digital nature: we reprogrammed him to be one of us. The app we used can be downloaded from our website at a very reasonable cost. IMPERSON™ (Identity Modified: Personality Edited and Replaced; Spirit of Original Neutralised) upgrades the mind of a human to be superhuman.

Yours, Father Hacker 2.0



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