Institution: University of Brighton

Unit of Assessment: B11 Computer Science and Informatics

a. Overview

Research in computer science and informatics at the University of Brighton (UoB) focuses on producing innovative ways to understand and share information by devising novel diagrammatic and visual modes of communication. Since RAE2008, our established research on diagrammatic reasoning has strengthened and broadened to encompass visualisation and new emerging themes of ontology engineering and cultural informatics. The majority of researchers in B11 focus on logic-based diagrammatic reasoning and visualisation (11 FTE), complemented by staff working on case-based reasoning and natural language generation (3 FTE). All staff are located in the School of Computing, Engineering and Mathematics (CEM).

The university's research environment has been enriched by the investment of £8.8m in research sabbaticals, doctoral studentships, innovation grants and early career researcher (ECR) support schemes. In comparison to RAE2008 this investment has increased the number of ECRs who are included in this submission from three to nine. The research environment has further benefited from significant infrastructure investment including a £27m refurbishment of the Cockcroft Building which will host B11 staff and new computing laboratories from 2014.

b. Research Strategy

Computing research at UoB delivers diagrammatic logics and visualisation techniques to document, analyse and communicate complex knowledge and information. We unite the diverse disciplines of visual languages, logic and reasoning, natural language generation, and automated diagram drawing, supported by empirical evaluations. Our performance in RAE2001 (grade 4) and RAE2008 (UoA23, 15% 4*, 40% 3*) indicates the sustainability of our research environment. Over the last six years, this pursuit has brought institutional investment in people, specialist resources, and the research infrastructure.

Research strategy and progress 2008-2013: Informed by the feedback from our submission to RAE2008, our research strategy during this period included the following aims:

RA1 build on our track record of excellence in diagrammatic reasoning that was recognised by the RAE2008 panel as an area of particular strength.

RA2 diversify our foundational work on diagrammatic reasoning to encompass visualisation and related specialist research.

RA3 support the development of our ECRs through targeted investment, reduced teaching loads and mentoring.

RA4 enhance the research environment through internal investment in the recruitment of high-quality research students.

The strategy is designed to focus on our core research in diagrammatic reasoning whilst building new areas of cognate research as exemplified by the following activities:

- The introduction of concept diagrams as a novel notation specifically for ontology engineering (RA1). This research led to [CHAPMAN,1], amongst other papers, and a tutorial at the 12th International Semantic Web Conference 2013. Rapid industrial take-up of concept diagrams is demonstrated by the Nokia Impact Case Study.
- The production of novel techniques for automated Euler diagram drawing, allowing the visualisation of sets [DELANEY,2; FISH,1; HOWSE,1,2,3; STAPLETON,1,2,3,4], supported by EPSRC funding (RA2). The University of Cambridge has integrated these techniques into its novel heterogeneous theorem prover called Diabelli.
- Brighton's BELZ leads the EPSRC Network on Vision and Language (V&L Net), further described in section e.
- The strategic expansion of research into case-based reasoning, via the appointment of Professor PETRIDIS and ECR KAPETANAKIS (RA2). This has created opportunities for interdisciplinary research in applied artificial intelligence and big data, combining high-performance computing techniques with data mining [KAPETANAKIS,1; PETRIDIS,1,2,3,4].

- The strategic recruitment of nine ECRs with targeted mentoring and investment (see section c) being rewarded with four EPSRC First Grant Awards (RA3).
- PhD recruitment rising from an average of 1.8 new registrations per year during the RAE2008 period to an average of 3.8 during this census period (RA4). The university funded the establishment of a new Doctoral College and has committed £3.5m for the funding of 60 research students in 2012–2015 (see section c).

Supporting management structures: The university manages its research through three areas: *Life and Physical Sciences; Social Sciences; Arts and Humanities.* Each area is led by a Director for Research and Development, who reports to the PVC Research and monitors each school's research performance and progress against UoB-agreed key performance indicators. The B11 research strategy is managed by the CEM School Research Strategy Committee (RSC, chaired by HOWSE) which identifies strategic research priorities, monitors achievements and administers the distribution of QR streamed as an outcome of RAE2008. The RSC is responsible for research staff development and delivery of the Research Concordat Action Plan (see section c).

Research strategy for the next five years: Building on our achievements since 2008, and reflecting the expansion of our research base, our future strategic aims are to:

SA1 *Invest in emerging multi-disciplinary and established research areas.* We will invest in staff and infrastructure that will help to position us as a recognised centre for solving visualisation, knowledge acquisition and communication challenges (see sections c and d).

SA2 *Manage and deliver impact from our research and communicate this to scientific, business and public audiences*. Alongside investment in research areas that can generate impact, we will monitor and facilitate impact, and embed impact into our research training. Enabling mechanisms are described further in the Impact Template.

SA3 *Develop leaders of tomorrow, through staff development, training and internal investment in PGR students and ECRs*. We will continue to provide opportunities for new ECRs; the university has ring-fenced financial support for PGR students, ECR development, first grant preparation and conference participation (see section c).

SA4 *Build our funding base as ECRs produce returns on the internal strategic investment.* We will continue to mentor ECRs through RCUK First Grant Schemes. They will be supported by senior colleagues in developing networks and consortium bids to RCUK, EU and industrial clients through lower teaching loads, and pump-priming funding (see section d).

We have advanced plans to pursue two strategic initiatives that underpin these aims:

Cultural Informatics and Digital Humanities (CI&DH) Centre. This centre will be housed in specialised accommodation recently purchased and refurbished by the university for £3m (see section d). The Centre will include four–year doctoral studentships in five intakes from 2014 from a joint EPSRC CDT with UCL and the University of Oxford on science and engineering for the arts, heritage and archaeology, 25% of which will be internally funded. The CDT is supported by approximately 50 external organisations, such as English Heritage, the British Museum and the British Library.

The Ontology Engineering with Diagrams (OntoED) Research Programme. OntoED is a strategic priority because of the increasingly important role of ontologies in the sharing of knowledge and information. Building on the successful deployment of concept diagrams at Nokia, OntoED will allow the development of ontologies diagrammatically. ECRs BURTON and CHAPMAN have lead responsibility for key deliverables. The OntoED team will be located in the new accommodation for computing in the refurbished Cockcroft Building (see section d).

c. People, including:

I. Staffing strategy and staff development

We have invested significantly in the intellectual and creative capital of our research community and value the contributions of all colleagues by:

- providing an environment that stimulates innovation and minimises constraints (RA3,4; SA3)
- ensuring fairness in the allocation of research support (RA3; SA1,3)
- recruiting talented, outstanding researchers to bring fresh ideas and insights (RA1,2,4; SA1)

- retaining and rewarding staff who are central to our research strengths (RA1,3; SA1).

Appointments in B11 are made in priority areas (congruent with RA1) and support a controlled diversification of activities (consistent with RA2). We have followed a policy of recruiting, retaining and rewarding high-quality ECRs. For example, ECR FISH is now a Principal Research Fellow; ECRs BURTON and CHAPMAN are now Senior Lecturers; BELZ and STAPLETON, who were ECRs in RAE2008, are now Readers. The professorial promotion criteria have been revised (2013) to provide an enhanced career framework, clear expectations and an extended remuneration scale.

ECR and research staff specific support: An ongoing strategic objective is the continuous enhancement of research capacity through the recruitment of ECRs and research staff in areas of research excellence. A key part of our sustainability is the retention of excellent researchers. Staff on short-term contracts have been offered permanent positions where possible (e.g. ECRs CHAPMAN, FISH and RODRIGUEZ ECHAVARRIA). ECR BURTON was retained after completion of a PhD studentship. This grassroots approach builds upon our research base, drawing on the leadership already present. All ECRs and research staff work in our core areas of expertise in alignment with our Research Strategy. For example, ECRs ALI and NICHOLSON specialise in automatically producing diagrammatic representations of code structure, supporting RA1. Other recruitments include ECRs RODRIGUEZ ECHAVARRIA and ZHOU working on 3D visualisation of cultural heritage artefacts and medical imaging, supporting RA2. Our emphasis on appointing ECRs has reaped dividends, with nine ECRs included in this submission. The three ECRs who were submitted in RAE2008 (DELANEY, alongside BELZ and STAPLETON), are all submitted as experienced researchers in REF2014.

Tailored support is provided to ECRs and research staff reflecting their early career stage, to deliver RA3. All ECRs are provided with a significantly reduced teaching and administration workload that provides time for developing research ideas and preparing funding proposals. ECRs are identified as research student supervisors whenever appropriate, joining a supervision team that includes an experienced colleague, ensuring effective staff training and PhD supervision. ECRs ALI, BURTON, CHAPMAN, FISH, KAPETANAKIS, RODRIGUEZ ECHAVARRIA and ZHOU all supervise PhD students.

Every ECR and research staff member is assigned a mentor who provides support for career development, the formulation of publication and networking strategies, and helps prepare funding proposals. ECRs and research staff are encouraged to gain experience of organising conferences and workshops, supported by their mentor where appropriate, aiding them with the development of their leadership skills; examples are given in section e. ECRs and research staff are also supported in grant application development by: senior staff who provide detailed feedback on proposals prior to submission; UoB's Grant Support Panel (comprising experienced grant holders), which reviews and provides feedback on all RCUK proposals; and the School's Business Development Manager, who explores linkages with industry.

UoB appointed an Early Career Ambassador in 2012, whose role is to co-ordinate support for ECRs and research staff across the institution and to facilitate networking and interaction. In 2010, the university started an annual conference, *The Future's Bright,* for ECRs, which provides workshops in proposal writing, impact delivery, leadership skills and career development. Over 280 ECRs from across the university have attended *The Future's Bright* over the last four years.

Support for all staff: There is a variety of internal investment schemes to support career development, which are available to all staff, including those on part-time and fixed-term contracts. This includes: sabbaticals (£250k–£350k), Rising-Stars Awards, primarily for ECRs (£100k), Research Challenges (previously called Research Innovation Awards) (£100k), Developing New Networks (£5k), a staff conference support fund (£30k) and a separate, ring-fenced conference support fund for ECRs (£10k). Within B11, FISH and ECR DELANEY were awarded sabbaticals (£20k each), ECRs BURTON and ZHOU gained Rising-Stars Awards (£10k each), and HOWSE and STAPLETON held a Research Innovation Award (£10k). Nine B11 staff were awarded staff conference support funds totalling over £10k. All B11 staff were supported further by a School travel budget of £30k per annum. In addition, the School funds research staff to support the delivery of strategically important projects driven by leading researchers. For example, ECR CHAPMAN was employed as a post-doctoral researcher (after his EPSRC-

funded post ended) to support STAPLETON, and the School is appointing a post-doctoral researcher to work on OntoED. Post-doctoral researcher Saleh has also been retained after the completion of Adige (see section d), under ECR FISH's direction.

Following extensive consultation across the institution, the university developed a Research Concordat Action Plan, recognised by the European Commission through the award of an EC European Human Resources Excellence in Research Award. The Action Plan is delivered by schools and is monitored by the PVC Research. One broad set of indicators for the Action Plan's impact is provided by the 2013 Careers in Research Online Survey (CROS; 46% return rate compared to 26% nationally), which shows: 91% of respondents are integrated into the research community (78% nationally); 96% are given the opportunity to present at conferences (81% nationally); 57% are treated equally compared with other staff in relation to promotion and progression (37% nationally); 64% engage with policymakers and end users (30% nationally).

Equality and diversity: All appointments adhere to UoB's Equality and Diversity Policy. Training on equality and diversity is strongly encouraged for all staff, and additional equalities training is embedded within management training. In 2013, the university was awarded an Athena SWAN Bronze Award. It is a Stonewall Diversity Champion and a 'Two ticks' Positive About Disabled People employer. Equality and diversity issues are discussed as a standing item at the RSC. The 2013 CROS showed that 91% of UoB respondents (86% nationally) considered the university to be committed to equality and diversity.

International visibility: The School has attracted visiting scholars, undertaken major roles in international projects, and collaborated with internationally recognised experts. These include Professor Beryl Plimmer, from the University of Auckland, who has spent two sabbatical visits at UoB during the REF period. Plimmer enabled DELANEY and STAPLETON to develop expertise in sketch recognition technologies [DELANEY, 2] and will host DELANEY during his sabbatical. ECR RODRIGUEZ ECHAVARRIA hosted Dr Asla Medeiros e Sá from Escola de Matematica Aplicada FGV/EMAp in Brazil [RODRIGUEZ ECHAVARRIA, 1] and is a work-package leader for the 19-partner EU-funded 3D-COFORM project, co-ordinated by UoB (REF3a). Other visitors include Professor Mark Minas, a leading figure in the visual languages community, and Dr Ian Oliver, a privacy expert at Nokia. Oliver has been instrumental in facilitating Nokia's take-up of concept diagrams. Our staff have been recruited from seven countries. Further evidence of our international visibility is provided in section e.

c. II. Research students

The university has taken significant steps to enhance the experience of our research students as our contribution to developing the next generation of researchers. All PhD students are now based within the Brighton Doctoral College (BDC), which was established in 2011 under the leadership of a new Dean who is responsible for postgraduate research. A Director of Postgraduate Studies oversees the application-to-graduation process for all PhD students in science and engineering that includes B11 students. The centre is home to 158 Doctoral students, of which 20 are computing specialists. A recent QAA report (March 2013) noted: '*since its [BDC] establishment the trajectory of almost all success indicators has been upward*'.

In line with RA4, in 2012 the university launched a three-year programme of £3.5m investment in 60 fully-funded PhD studentships. ECRS ALI, BURTON and FISH, along with HOWSE, PETRIDIS and STAPLETON, are all supervising students through this programme. The publicity generated by this new initiative has resulted in student applications to the Doctoral College rising by 200% since 2010. General international recruitment has been enhanced by strategic initiatives, such as engagement with the Iraqi Ministry of Higher Education and Scientific Research and the Brazilian 'Science without borders' scheme. Other PhD candidates come from within our student population due to research-led teaching (eg Clark and Alqadah).

The BDC has ownership and overview of the research learning environment and manages all applications and recruitment, monitors progress, and contributes to, and organises, university-wide training programmes. All new students are expected to develop a full training needs analysis with their supervisors, evaluated against Vitae's RDF and their project requirements. Formal training is provided through the university Researcher Development Framework within the BDC: all new PhD students are required to demonstrate learning from core units on research methods, project

planning, ethics and IP. Further developmental opportunities for B11 students arise through participation in the BDC's annual science and engineering conference, which is student-organised and led (100 attendees in 2013). Research students are supported from School and university funds, including access to a ring-fenced PGR Conference Support Fund (up to £1.2k per student). On graduation, PhD students have entered academia (eg Fallahkhair) and industry (e.g. Newman), while ECR BURTON and DELANEY are senior lecturers within the university.

All PGR students have at least two supervisors and a thesis panel to monitor progress. All supervisors undergo dedicated training prior to joining the approved register and this training must be refreshed every five years. Each student receives a minimum of 90 hours (pro-rata for part-time students) of supervisors' time per year. Supervision is complemented by a series of check-points, following established BDC procedures, ensuring that satisfactory progress is taking place and the supervisory team is fulfilling its responsibilities. The first checkpoint is research plan approval, occurring 4–6 months into the research degree. This is followed by annual progression reviews, which are designed to ensure that the needs of the student and project are being met. Students are expected to submit a thesis completion plan and three completed draft chapters after 30 months of study to aid timely thesis submission.

d. Income, infrastructure and facilities

Infrastructure and facilities: The UoB has made significant ongoing investments in computing infrastructure and the physical environment. Major capital investment is evidenced by the £27m refurbishment of the Cockcroft Building (2013–15). This will provide new accommodation for CEM, positioned alongside other schools in the Faculty of Science and Engineering. The refurbishment includes a £2.5m purpose-built computer science research laboratory. Further capital investment of £1m has purchased accommodation for the CI&DH Centre (see section b), alongside a further £2m refurbishment programme. This is complemented by £135k for specialist high-performance computer clusters, ultra-fast networking and high-capacity data storage to enable 3D data capture and manipulation of digital artefacts, as well as refurbishment of the novel interfaces laboratory.

B11 staff are provided with several usability laboratories, one of which is designed for one-on-one data collection and one-directional observation. They give access to a range of specialist equipment, including multiscreen, large-scale and 3D displays, hand-held devices (e.g. tablets), and advanced eye trackers. The laboratories are used extensively and provide core resources for our diagrammatic and visualisation research and are particularly important for delivering RA1. The laboratories are used regularly by industry for usability studies. In 2013, this included the Rock Insurance Group and Brightwave Limited working for Diabetes UK.

Funding portfolio: During the census period, a total of 30 research grants have been held, totalling £1.46m in income, from funders including the EPSRC, the ESRC, and the EU. Research funding is complemented by other industry-focused streams, such as TSB-funded Knowledge Transfer Partnerships, and JISC funding.

Key areas that have attracted EPSRC funding during the REF period encompass diagrammatic reasoning and visualisation, supporting RA1 and RA2. Diagrammatic reasoning was supported by *Defining Regular Languages with Diagrams* [PI: STAPLETON], on which ECR CHAPMAN worked as a post-doctoral researcher. Visualisation research has been supported by three EPSRC grants: *Visualization with Euler Diagrams* (VwED) [PI: HOWSE], on which FISH was a post-doctoral researcher and which ran jointly with the University of Kent; The foundational work on VwED was built on extensively in *Automatic Diagram Generation* [PI: FISH]; and *Sketching Euler Diagrams* (SED) [PI: STAPLETON], both with Nokia as a project partner. RA2 has been further supported by EU funding, including the multi-million euro 3D-COFORM Project.

A major part of the income strategy, relating to RA3, is to support ECR staff with the preparation of proposals to the first grant schemes at RCUK. During the census period, BELZ, ECR FISH, and STAPLETON held EPSRC First Grants and ECR RODRIGUEZ ECHAVARRIA's First Grant has recently been awarded, to commence in 2014. BELZ built on the success of her First Grant attracting four EPSRC grants to support Generation Challenges (a series of events bringing together a variety of shared-task evaluation efforts that involve the generation of natural language) in addition to V&L Net.

Future funding plans: A variety of mechanisms are in place to ensure SA4 is met. All eligible ECRs, including ALI, BURTON, CHAPMAN, KAPETANAKIS and NICHOLSON, are preparing EPSRC First Grant applications. This preparation is supported by the investments made in our ECRs, such as BURTON's Rising-Star Award. These First Grant applications are complemented by a continued drive to obtain RCUK funding, particularly for our research priorities. The primary research foci tie in with EPSRC priority areas: *Data to Knowledge*, *Digital Identity* and *Graphics and Visualisation,* as well as the cross-ICT priority *Towards an Intelligent Information Infrastructure*. As well as RCUK funding, we intend to apply for further EU funding, for example, for OntoED.

Consultancies and services: Congruent with SA2, to develop more flexible funding streams, the School recruited a Business Development Manager (in 2012) and, specifically for OntoED, a consultant; see the Impact Template for more details. This agenda is further supported by the School's new *Proof-of-Concept* programme that provides funding (up to £25k) for early stage research, prototyping, and impact-related activities (REF3a). The key objective of this programme, with respect to early stage research, is to build portfolios that are at a point of maturity necessary for securing major external income from the EU and RCUK for long-term sustainability or for delivering impact.

e. Collaboration and contribution to the discipline or research base

Collaboration and interdisciplinary research: Staff engage with a range of partners as noted in the Impact Template and Impact Case Studies. Of the submitted outputs, 75% are co-authored with external academic or industrial partners, while 25% are co-authored with non-UK-based partners from seven different countries. Collaborators include Bottoni (University of Rome), who is working with ECR FISH on the application of diagrams to real-world problems [FISH, 2]; Jamnik (University of Cambridge), who is working with STAPLETON on heterogeneous (symbolic and diagrammatic) theorem proving, utilising UoB's results on diagrammatic reasoning and automated diagram layout [HOWSE, 3, STAPLETON, 2]; Plimmer (University of Auckland), who has spent two sabbaticals at UoB, one of which was funded by the EPSRC on the SED project, devising state-of-the-art sketch recognition technology for diagrammatic logics [DELANEY, 2].

Long-standing collaborations with Cheng (University of Sussex), de Chaira (Poste Italiane), Flower (Autodesk), and Rodgers and Thompson (University of Kent) have been maintained. Cheng jointly supervised a PhD student with HOWSE on the empirical evaluation of diagrams. FISH collaborated with de Chaira on visualisation topics, supported by an international mobility grant allowing ECR FISH to be a visiting professor at the University of Salerno in 2013. Flower developed the first automated Euler diagram drawing method and has continued this line of research with HOWSE, Rodgers and STAPLETON [HOWSE, 3; STAPLETON, 3, 4]. Rodgers was the Kent PI on VwED, which delivered advances in Euler diagram drawing. Research by DELANEY and STAPLETON with Thompson has pushed the boundaries of what can be expressed diagrammatically [DELANEY, 3].

Interdisciplinary research is exemplified by both the EU 3D-COFORM and the EPSRC Network V&L Net, on vision and language. V&L Net is a forum for researchers from the fields of computer vision and language processing to meet, exchange ideas, expertise and technology, and form new partnerships. This network is creating an interdisciplinary research community situated at the language-vision interface, working towards solutions for challenging computational problems, including image and video search, description of visual content and text-to-image generation.

End-user engagement: The involvement of end users has become an increasing priority, reflected by SA2. Exemplary collaborations with end users include Nokia, as detailed in the Impact Case Study. Growing interest in the practical application of concept diagrams to ontology engineering has seen the expansion of our collaborative network, to include CSIRO [CHAPMAN,1], which hosted a visit from STAPLETON in 2013. Our collaborations with Nokia and CSIRO are a major priority, reflecting our future strategic aims and goals for research, and they are end-user collaborators on OntoED. Their involvement informed the strategic prioritisation of OntoED as they have demonstrated an industrial need for diagrammatic approaches to ontology engineering.

Support for collaborative research and end-user engagement: The internal investment schemes, described in section c, provide substantial support for collaborative activities. For example, HOWSE's and STAPLETON's Research Innovation Award supported work with Nokia and led to new collaborations with the Helsinki University of Technology, the University of Auckland (e.g. *SED*) and CSIRO. It also funded visits to Manchester and Monash universities. ECR BURTON's Rising Star Award (£10k, 2013–2015) supports new collaborations with Stanford University, a centre of excellence for ontologies research, and continued activities with Nokia and CSIRO.

Roles in the academic community: To maintain and enhance our status in the community, staff are encouraged to undertake leadership roles within the academic community.

Staff engage with external bodies that provide leadership to the academic community. For example, PETRIDIS has been Secretary of the British Computer Society since 2006. BELZ is a member of the EPSRC Peer Review College. Staff review proposals for the EPSRC, ESRC, EC, the Canadian NSERC, the Israel Science Foundation, and the US National Science Foundation.

BELZ and STAPLETON serve on the editorial boards of *Computational Linguistics (CL)* and the *Journal of Visual Languages and Computing (JVLC)*, respectively. *CL* is the official journal of the Association for Computational Linguistics. *JVLC* is the core journal on visual languages research. Through the organisation of five special issues of *JVLC*, UoB has consolidated its position in the visual languages field; themes covered include visual logics (eds: Cox (Dalhousie), ECR FISH, HOWSE), Euler diagrams (eds: ECR CHAPMAN, Micallef (Kent)), and diagram aesthetics and layout (eds: Plimmer (Auckland), Rodgers (Kent), STAPLETON).

Major leadership roles include being members of conference steering committees that determine the direction of research undertaken in the respective areas. STAPLETON is Chair of the Diagrams Steering Committee (since 2012, member: 2008–2019), of which HOWSE is a member (2002–2014). Diagrams is the only major international conference series that provides a united forum for all areas of diagrams research. HOWSE (2010–2014) and ECR FISH (2013–2017) are members of the IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC) Steering Committee. VL/HCC is a premier international forum, established in 1984.

Staff have been general Chairs or programme Chairs on over 40 occasions since 2008, including 14 times by ECRs; ECRs ALI, BURTON, CHAPMAN, FISH and RODRIGUEZ ECHAVARRIA have all been general or programme Chairs. Staff served on over 80 programme committees during the period, including over 20 times by ECRs. Exemplars include MODELS 2011 (HOWSE), IUI 2014 (DELANEY) and FOIS 2014 (STAPLETON). MODELS is the premier conference series for model-based software and systems engineering. FOIS (International Conference on Formal Ontology in Information Systems) is the flagship conference of the International Association for Ontology and its Applications. PETRIDIS has been Chair of the UK Case-Based Reasoning Workshop since 2005 and Chair of the AI-20XX series of conferences since 2007. This is the leading series of UK-based international conferences on AI and the longest-running AI conference series in Europe.

Awards: HOWSE (with Gil and Kent) received the Most Influential Paper Award at VL/HCC 2009, for important influences on VL/HCC research and commerce over the last ten years. BELZ received the Best Paper at the 12th European Workshop on Natural Language Generation [BELZ,1] and was Winner of the EPSRC Early Career Workshop Network Grant Competition 2008. Further examples of the recognition of research quality include Best Paper Awards at the *Australasian Ontologies Workshop 2009* and at *Visual Languages and Computing 2012*, given to HOWSE and STAPLETON.

Keynotes and invited talks: HOWSE was a keynote speaker at the International Conference on Conceptual Structures 2008 and was invited to speak at the 4th International Workshop on Semantic Sensor Networks 2011. STAPLETON was a keynote speaker at Diagram Logic and Cognition 2013, held in Kolkata, and has accepted an invitation to deliver a keynote at the 17th Brazilian Logic Conference 2014. ECR KAPETANAKIS was an invited speaker at the 18th UK Workshop on Case Base Reasoning 2013.