Unit-level environment template (REF5b)

Institution:	Glyndŵr University

Unit of Assessment: UoA11 – Computer Science and Informatics

1. Unit context and structure, research and impact strategy

Structure

This submission is made within the context of a compact university with approximately 180 academic staff and 6,500 students. There have been two major university restructures since the last REF, the most significant in 2018 following the arrival of the new Vice Chancellor and leadership team and a reconfiguration from Schools to Faculties, creating larger, more cohesive academic units. There are two faculties: The Faculty of Arts, Science and Technology and the Faculty of Social and Life Science, each led by a Dean and supported by a team of four Associate Deans and a Faculty Business Manager.

In REF2014, it was stated that the University aimed to support academic staff associated with the subject areas covered by this UoA in gaining research degrees, so that by 2016, 80% of departmental staff would be qualified to doctoral level. This would increase the extent to which staff are able to engage in collaborative research with colleagues in other institutions, in the UK and internationally, produce high quality research outputs, and increase the capacity to supervise postgraduate research students.

In REF 2014, Glyndŵr University submitted in Computer Science and Informatics for the second time, achieving overall ratings of: 5% 4*, 16% 3*, 57% 2*, 22% 1*, and 0% U/C. The number of researchers submitted to REF 2014 (6.4) was double that of the number submitted in 2008. The two restructuring exercises since 2014 have had a negative impact on staffing in this area. Data from October 2020 indicates that 38% of the 13 members of academic staff associated with UoA11 have a doctoral qualification and 46% are PGR supervisors (4 of whom are Principal Supervisors and so included in this submission). There has been a greater focus on supporting staff who are at earlier and early/mid stages of their research careers to gain their own doctoral qualification, to take first steps in collaboration, to create research outputs, to recognise and act on the importance of impact arising from research, and to become eligible to supervise postgraduate research students. This is with a view to the University attaining Research Degree Awarding Powers (RDAP) by 2025. An encouraging sign is that 38% of UoA11 staff are studying towards a doctorate.

In addition to staffing changes, developments and progress have been shaped by increased internal collaboration (e.g. with health and digital design) and a greater emphasis on the research-teaching nexus.

The University encourages and supports interdisciplinary research, and this submission includes staff from both Faculties. Staff who are independent researchers with significant responsibility for research are:

Faculty of Arts, Science and Technology

Grout (Professor of Computing Futures): Computer networking and telecommunications, Algorithms/optimisation, Computing futures
Houlden (Reader in Cyber Security): Cyber security and Data Privacy
Picking (Professor of Human Computer Interaction): Human-computer interaction

Faculty of Social and Life Science

Pike (Principal Lecturer): Companotics, Dementia

The University's research strategy has as its principal aims:

- Develop research capacity and capability of the university by developing its staff
- Grow the post-graduate research community
- Increase the number of active industrial and academic research collaborations
- Grow outputs and income associated with research
- Increase the visibility, impact and value of our research

Overall responsibility for matters related to research rest with the University's Research Committee, which reports directly to the Academic Board. The committee is chaired by the Pro Vice-Chancellor for Research. The committee's remit particularly concerns the development of relevant policies and procedures, the identification and dissemination of good practice in research across the University, and oversight of research governance matters. Informed by the University's Vision and Strategy Statement (2020-2025), an Action Plan for research is developed on an annual basis by the Research Committee; the current Action Plan has a particular focus on supporting less experienced staff develop their research capacity and experience. The Associate Deans with responsibility for research are responsible for implementing the Action Plan. A recent development is the recruitment of 'Research Strand Leads' to act as champions to encourage and co-ordinate research within and across disciplines. **Houlden** currently has this role for Computing.

External Engagement

All current research activity at the University is underpinned by the University's Vision and Strategy Statement (2020-2025), which seeks to position the institution as an anchor point for the region with a distinctive applied focus and mission to inspire and enable economic, cultural, and social success. Practitioner experience informs learning and teaching at the University and is leveraged to meet the economic needs and enrich the communities that the University serves. The research ambition is that the University will engage in 'Research that Transforms'. To this end, the University is seeking to improve its research capacity and performance in meaningful partnerships, with a strong emphasis on research that has an applied and/or commercial potential to support economic, social, and cultural development.

Academic staff across the University are encouraged and supported to engage in research related external engagement such as collaborative research, external supervision/examining, knowledge transfer, public engagement, and engaging in the work of professional bodies and subject associations. All the submitted staff in this UoA are active and recognised contributors to professional associations, learned societies or subject associations, as are two thirds of the broader cohort of staff associated with this UoA. Funded research is expected to have a pathway to impact (exemplars: **Grout** – Age gating of alcohol sales; **Picking** – underpinning research for Erasmus+ multinational e-health curriculum development project).

Open Access

The UoA is supported by the University's Research Office, which manages Open Access issues across the institution, and all submitted staff are represented in the online repository, Glyndwr University Research Online. The University's Digital Enhancement Strategy includes as one of its domains, 'To develop a digital research environment that will allow University staff to enhance their research capacity and capability in order to drive innovation and increase the visibility and impact of their research.' The Strategy is driven by the Digital Enhancement Programme Board, and the Priority Actions include, 'To ensure that information and research data management practices are appropriate and support knowledge creation and sharing.' The University has a policy on Open Access to Research Data, and a strategy and action plan for enhancing implementation are in preparation.

Research Integrity

The Research Office also supports staff across the UoA in terms of research integrity, including

compliance with concordats. The Research Office provides the operational support for the University's Research Ethics Sub-Committee (RESC, reporting to the Research Committee), which develops policy and guidance regarding research ethics, monitors policy implementation, and reviews applications for ethical approval in certain categories. In 2020, one member of staff associated with this UoA was a member of RESC.

2. People

Staffing strategy and staff development

There are 13 members of academic staff associated with UoA11, 4 of whom meet the criteria set out in the University's Code of Practice for inclusion in the REF submission.

The University's aims are aligned with the three principles of the Researcher Development Concordat:

1. **Environment and culture**: continue to build and enrich the research environment across all areas in the University through the Associate Deans (Research) and the Research Strand Leads, encouraging research groups to form and collaborate.
2. **Employment**: ensure a focus on recognition, explicitly including Postdoctoral Research Assistants (PDRAs), Graduate Teaching Assistants (GTAs), and colleagues at earlier stages of research careers in the University's processes for self-reflection, for the availability of critical friends, and for review of research ambitions and barriers.
3. **Professional and career development**: ensure PDRAs, GTAs and colleagues at earlier stages of research careers are included in all relevant opportunities to take part in events and training & development activities, supporting the acquisition of transferable skills and valuable experiences.

The University holds the HR Excellence in Research Award and has recently submitted a new Action Plan. The University's policies and processes are consistent with the principles of the Concordat to Support the Career Development of Researchers. The revised Concordat was published in 2019 and the University has revised its related strategy and action plan to more closely align with the stated focus of the revised Concordat. The focus of the University's strategy is on Research Assistants and GTAs, that is, individuals at very early stages of their research careers. Priority actions concern communications with staff regarding the Concordat, support for managers completing probationary reviews, guidance provided to reviewing managers to include specific objectives around engaging with research activity and relevant training, and staff are also contributing to a study of 'what makes a good research environment?'. A PGCert programme, 'The Confident Researcher', is to be launched in 2021 in a pilot phase, and it is expected that at least one of the UoA11 submitted staff will be involved in this pilot.

The university has set a requirement for all new academic staff to have a doctorate, complementing their professional experience. This is to help achieve the desired aim of achieving growth of the research capacity and capability, set out in our strategic plan. Between 2014 and 2017, the proportion of staff with a doctoral degree dropped due to the restructuring and stabilisation of the university during that time. Following the introduction of the requirement for new staff to hold a doctorate together with existing staff success in their studies, the proportion has steadily increased; 36% of all academic staff and 41% of full-time staff now hold a doctoral qualification. 38% of all academic staff associated with UoA11 hold a doctoral qualification and a further 38% are currently studying towards a PhD.

This policy is supporting an increase in PGR supervisory capacity. 46% of academic staff associated with UoA11 have either Principal or Secondary supervisor status (the former is the criterion set out in the Code of Practice for recognition as 'an independent researcher with significant responsibility for research').

In Computing at Glyndŵr University, the University has adopted a strategy of growth and renewal. In the context of research, this has included the recruitment of GTAs, who are registered for full-time MPhil/PhD studies, and are contracted to support students in laboratory environments, for example. GTAs are encouraged to apply for full academic lecturer posts, should they become available in their specialist areas. Of the four GTAs thus far recruited in the UoA under this strategy, two have since become full time academic staff. These staff have continued to be research active as they progress towards achieving their doctorates, and are supported, mentored, and supervised towards completing their doctorates, and as early career researchers. This strategy has proved to provide an excellent career path/opportunity for GTAs and gives the University confidence in terms of succession management in such a rapidly evolving field.

Academic staff are normally appointed on indefinite (permanent) Teaching and Research contracts of employment.

The university now requires all academic staff to have a personal research plan (PRP) as part of the Professional Development Review process. This plan is discussed during the review as a basis for supporting the member of staff and is also used by the university for planning of research spend priorities. 54% of the current PRPs of staff associated with UoA11 indicate research activity, and 54% provide evidence of personal experience of research in other institutions (e.g., collaborative research and contributions to seminars). PRPs include opportunities to comment on perceived barriers and requirements, as well as providing a framework for setting out achievements and forward plans; they are a valuable resource for the Associate Deans in their ongoing assessment of the research environment and forward planning.

To encourage the development of the existing and incoming staff base, the University has benefitted from visiting professor / researcher appointments that act as a catalyst in raising the profile of research. In UoA11 during the assessment period, this have included Professor Neil McEwan, senior researcher at SARAS Technology Ltd, specialising in design of advanced wireless telecommunications systems; Professor Raed A. Abd-Alhameed, Professor of Electromagnetics and Radio Frequency Engineering at Bradford University; Professor Udo Bleimann, from the University of Applied Sciences, Darmstadt, Germany; and Professor Alexander Chernikov, Kharkov National Automobile and Highway University.

Individuals included in the REF2014 submission, the late Excell and Earnshaw (Emeritus Professor and Visiting Professor respectively) continued to support research staff development within UoA11 and across the University during the assessment period. Both were associated with the Internet Technologies and Applications series of international conferences run by the University's Computing department. Excell co-authored several publications with colleagues across the Computing and Engineering fields, and Earnshaw has brought together colleagues from Computing and Art & Design in novel collaborative activity and the creation of outputs. Earnshaw has also supported researchers at earlier stages of their research careers through informal mentoring and the promotion of pathways into research.

The university has a work allocation model, which is used to record and moderate time devoted to teaching research and citizenship. Time allocated for research depends upon either the member of staff having funded work, a plan to undertake research, paper writing, or grant submission demonstrated through the individual's personal research plan.

A programme of generic skills training and personal development events based largely on the Vitae Researcher Development Framework is provided for the research community. A joint faculty Research Seminar series includes talk from researchers within and outside the University. There are two staff conferences each year, which have a strong research component. **Grout** has contributed to the staff conference series (Writing for publication).

The medium-term objective in developing research culture and capacity within the university is to

achieve Research Degree Awarding Powers. Associated with this, there is a focus on supporting early career staff to gain doctoral qualifications and developing staff in posts towards holding significant responsibility for research. There is support for staff to take the first steps in collaborative projects with other universities and in presenting at conferences with three awards open to all staff and research students. The first is the 'External Funding' award, for staff who have an opportunity to bid for external research funding with colleagues in one or more other institutions, and who have not previously gained external research funding. The second is 'First Collaboration' award, for staff who have not previously undertaken a structured research project (funded or unfunded) with colleagues in one or more other institutions. The final one is the 'Conference Contribution' award, for staff to have the opportunity to present during the current year at an academic conference or a conference run by a professional body (including a poster presentation). This award is also open to Postgraduate Research Students.

The Associate Deans for Research have a particular interest in encouraging interdisciplinary research links within and between academic fields, and productive relationships have formed between Computing, Health, and Psychology staff leading to collaborations in, for example, companotics (**Picking, Pike**), and immersive environments (Roberts, Williams, Richards, Mason).

There is a 50% fee waiver for all staff wishing to undertake a PhD, all new members of staff have a lighter teaching load to encourage them to engage in research, and there is also a sabbatical policy to enable time for research. There are also informal mentoring arrangements available to staff.

In January 2021, the University appointed a Research Impact Manager to provide dedicated encouragement and support to academic staff across the University, complementing the existing support from the Research Office, Enterprise Team and the Associate Deans for Research.

The University is a member of GuildHE Research, the research consortium for smaller and specialist higher education institutions. This organisation is a collegiate peer-to-peer network of 30 comparable institutions that supports its members to embed a positive research culture, develop robust research and innovation strategies, and establish appropriate infrastructure through which they can drive forward their ambitions. It provides researchers of all stages with opportunities to network and collaborate with peers across the UK and from a broad range of disciplines, facilitating activities face-to-face and virtually, including an annual doctoral summer school, training events, and opportunities to forge new projects and communicate their research. Membership of GuildHE Research created the opportunity for a collaborative project involving a business partner and another university, which has led to one of the University's Impact Case Studies.

Research Students

Although the University (and its predecessor, the North East Wales Institute of Higher Education) has been awarding research degrees since 1975 (more than 300), there was a student recruitment hiatus between 2014 and 2016 following the University of Wales's withdrawal from awarding research degrees for partner institutions. The University of Chester is now our awarding body, and the University's PGR student population is increasing again. 38% of academic staff associated with UoA11 are eligible to be nominated to supervisory teams. The 2019/20 HESA return reported 73 PGR students, and 14 PGR students are currently supervised by academic staff associated with UoA11. Increasing supervisory capacity is a priority to enrich the research environment and to support our aim of having more than 80 PGR students across the University by 2022/23. Academic staff without a doctoral qualification are supported in achieving that, and 5 staff (38%) associated with UoA11 are currently studying towards a PhD.

Recruitment of doctoral students

The University's doctoral students in UoA11, as in other areas, have different pathways to joining the University. During the assessment period enrolments have occurred through relationships with industry, through progression from PGT programmes, and through independent applications to the University. Several students are University staff seeking to gain doctoral qualifications.

Reflecting the University's encouragement for interdisciplinary research, submitted staff have co-supervised research students with colleagues in other disciplines, for example:

Picking: Personality: Moderators of navigation around a virtual environment (Psychology)
Picking: Explorations of Human role in Social (graphic) Graphic Design of Big Data and algorithms, with regards to young people and participation in research process (Social Work; Art & Design)
Grout: The Development of Maintenance Management Strategies within the Wind Power Sector (Engineering)

All PGR supervisors undergo Equality, Diversity, & Inclusivity training as part of the preparation for that role; the HR department manages that process.

The total number of research degree awards during the assessment period, where supervisory teams have been associated with UoA11 is:

Research Degrees awarded							
	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
PhD	2	2	2	4	1	1	1
MPhil	0	1	0	0	0	0	0

Monitoring and Support

Administrative monitoring and support mechanisms are currently based within the University's Strategic Planning and Student Administration Directorate (SPSA). Progress is monitored initially by the supervisory team, reported to SPSA. SPSA staff undertake twice-yearly audits to highlight cases where potential slippage is evident, enabling remedial action at an early stage. The two Associate Deans for Research provide an additional resource supporting and encouraging supervisory teams. SPSA maintains a formal register of PGR supervisors (linked to University of Chester criteria). New academic staff are assessed for eligibility as part of the joining process, and the Associate Deans for Research undertake an annual review of all current supervisors.

Skills Development

Support for PGR students in terms of induction and training is mainly provided at University level, led by the Researcher Development Tutor. All research students are required to take part in the University's research and transferable skills training programme. This has been mapped against the Vitae Researcher Development Framework and supports students throughout their programme of study. Feedback from students contributing to enhancement work is gained directly through the Student Voice Forum, through student representation on University committees, and through analysis of responses to PGR student experience surveys. PGR students also have access to the Students' Union's 'Tell Glyn' and 'Ask Glyn' online contact services, and to its Postgraduate Students Officer, which together help the SU to be effectively informed about issues that it may take up with the University.

A rolling programme of generic and subject specific training events on the following themes:
•   Student Induction Day
•   Intellectual Property
•   Identifying Questions & Testing Strategies
•   Effective Communications for Research

- •   Research Ethics
- •   How to Survive Your Viva
- •   Writing for Publication
- •   Qualitative Methodology
- •   Visualising Research
- •   Researchers do Radio
- •   The Art of Research

The monthly 'Open House' for Researchers is an informal event open to all staff and PGR students and takes the form of a mini workshop/networking opportunity whereby researchers are invited to talk about their research for 6 minutes without the aid of any visual props. This is particularly designed to support PGR students and staff at earlier stages of research careers, and **Picking** and **Pike** (and previous staff member Cunningham) have been speakers, as has a PGR student supervised by **Picking**. There is also a Visualising Research competition once a year with a prize for the best photograph that depicts a research project.

For the Visualising Research Competition, we invited researchers to create a photograph that will 'inform, engage, and intrigue a non-specialist academic audience and offer a visual perspective on your current doctoral research'. This was first run in 2019, and ten very high-quality entries were received. These have subsequently been exhibited in gallery space and online.

In 'The Art of Research', PGR students are paired up with creative artists and asked to articulate their research aims and objectives in an accessible way. The artists then graphically illustrate their research journeys to produce large colourful posters. The aim is to immerse the students in an exercise that encourages them to think and work in a different way.

Until recently, the University hosted a community radio station (Calon FM) based in its Creative Industries Building. In February 2018, station editors ran a half-day 'Researchers Do Radio' workshop, including a communication seminar, script editing workshop, and time recording in the studio. Calon FM staff then edited these recordings and distributed them back to the students. The feedback from students at the event was positive.

A PGR student experience survey conducted in 2018/19 found that all respondents were satisfied with their experience of their research degree programme. A follow-up survey in 2019/20 again provided positive feedback. The relatively small number of students across the institution means that data cannot be reliably broken down by UoA.

Equality and Diversity

A commitment to promoting Equality and Diversity is inherent within the University's Strategic Framework, in particular, its commitments to creating a community that welcomes students, staff and visitors from all backgrounds, placing them at the heart of what we do, treating them with dignity and respect and providing equality of access at all times. The University operates to nationally agreed standard recruitment practices, which do not discriminate on the grounds of protected characteristics. Equality data monitoring and action planning is embedded into the university's staff recruitment policy.

All WGU properties are accessible with adjustments based on individual needs considered and where possible put in place. Inclusivity in relation to disability is the responsibility of all staff, and of the Disability & Learning Support Team who provide guidance and support throughout a student's time at the University. The Assessment Centre provides a professional assessment, advice and training service to students with disabilities.

The University actively encourages staff and student applications from diverse national and ethnic backgrounds. The University's Welsh language policy commits the University to treating

the Welsh and English language on the basis of equality and in accordance with the Welsh Language Act 1993. Sabbaticals and fellowships are available to staff in the University to pursue Welsh language training and awareness courses. Application forms received in Welsh can be processed in Welsh and any necessary interviews can be conducted in Welsh. Religious literature and faith-based support is available within the Learning Centre and Student Union, including a quiet room for prayer and reflection. An inclusion and diversity event including exhibitors and contributions from local organisations and charities takes place annually in November, with members of the Chaplaincy and Equality & Diversity Action Group working collaboratively. The University achieved Stonewall Diversity Champion status in November 2016. The Stonewall index is used by the charity and the University to assess the progress the University is making towards LGBT+ inclusion. Since 2017, Wrexham Glyndŵr University has risen 60 places in the Stonewall Workplace Equality Index so that it is now placed at 180th from a total of 550 organisations.

The University has conducted three Equality Impact Assessments during the development and implementation of its REF Code of Practice. The disclosed data suggest that the adoption of eligibility to be nominated as a PGR Principal Supervisor as the criterion for identifying 'staff who are independent researchers with significant responsibility for research' had no negative or positive impact in terms of the attributes considered in the EIA, except for age and gender. Older individuals and male staff were more likely to have PGR Supervisory status. Regarding sexual orientation, the proportion of individuals who had declined to provide information was greater amongst the group of staff with PGR supervisory status; the numbers of individuals are so small that no reliable conclusions could be drawn. Female staff did appear to be under represented in the group of staff eligible for nomination as a PGR Principal Supervisor (39% of that group, compared to 57% of all academic staff). This appears to be symptomatic of a broader gender issue in academic employment and not specifically related to PGR supervision (and so REF). Staff aged less than 51 years did appear to be under-represented in the group of staff eligible for nomination as a PGR Principal Supervisor (26% of that group were under 51, compared to 53% of the comparator group). This is symptomatic of the substantial restructuring that has taken place, with many less experienced academic staff not yet meeting eligibility criteria. The University's process for assessing staff eligibility for nomination as a PGR Principal Supervisor is robust and fair.

No statistical analysis was carried out at UoA level because of the small numbers of individuals involved.

Submitted staff were involved in selection of outputs, being invited to nominate outputs for inclusion. The University's Professorial and Readerships Committee undertook a further review of that shortlist to arrive at the final selection of outputs for inclusion. The distribution of outputs across staff is based on that process, and reflects the Code of Practice's statement that, 'This Code is based on the principle that the University has an overriding obligation to ensure that it best meets the generic and specific requirements of REF 2021 in terms of research quality in order to maximize the outcome for the University but with due regard to equality and diversity.'

3. Income, infrastructure and facilities

University Support

The University's Enterprise Team's role is to support academic staff across the institution in knowledge transfer activity through applied research, academic consultancy, and training. The role of two members of the University's Enterprise Team is to identify research, commercial and capacity building opportunities, and funded projects. These project managers work flexibly with colleagues responding to tenders, research calls, and building projects from scratch; providing resources including strategic and administrative support covering budget, compliance, business case development; and project managing the application process according to the needs of the principal investigator/project delivery lead, liaising with Finance and Research Services as

required. Here, the compact size of the university facilitates close and expedited conversations to meet the short deadlines often associated with procurement exercises and quality assurance.

In January 2021, the University appointed a Research Impact Manager to provide dedicated encouragement and support to academic staff across the University, complementing the existing support from the Research Office, Enterprise Team, and the Associate Deans for Research.

Evidence of Income Generation, Grant, and Contract Capture

Total research income in the assessment period was £52,000 from UK charities, public and commercial organisations. HESA data shows a total of -£94,000 in 2013/14. This is due to a recovery of a previous grant overpayment.

Despite staffing changes outlined above, submitted staff and other staff associated with UoA11 have gained £108k in grants & contracts during the assessment period:

Picking: KTP with UPLEC Industries (To develop an innovative way for patients to access physiotherapy rehabilitation in the home and improve their interaction with physios, consultants and healthcare workers, 2016-2017, £80,400)
Grout: Alcohol Change UK (Age-gating of online sales, 2020, £7,000); Institute of Alcohol Studies (Effective Online Age-Gating Using MCC Codes, 2020-2021, £9,856)
Pike: RCBC Wales fellowship (2019-2020, £10,774)

4. Collaboration and contribution to the research base, economy and society

Support for stimulating external engagement

Current data indicate that all the submitted staff in this UoA are active and recognised contributors to professional associations, learned societies or subject associations, as are more than half of the broader cohort of staff associated with this UoA. The same numbers are or have recently engaged in collaborative research with other institutions. The recently appointed Research Impact Manager's role in supporting academic staff's external engagement will increase these proportions. The Associate Deans for Research and the Research Strand Leads in specific subject areas give advice and encouragement; the Research Development Awards scheme, albeit modestly, supports staff particularly at earlier stages in research careers; the Enterprise Team support academic staff in business and community engagement (directly and through events such as Business Breakfasts) and IP/contract issues.

Exemplars of contributions to / recognition by the research base

Grout was Chair of Welsh Council of Professors and Heads of Computing (CPHC) and UK CPHC Committee Member 2013-2017; Member of the BCS Information Privacy Expert Panel 2013-2017; European Commission Horizon 2020 (H2020) Future and Emerging Technologies (FET) 'Open' Panel Vice Chair 2014-present; Expert Ethics Screener 2013-present and Personalised Healthcare Expert Assessor 2012-present, E-Health, Well-being & Ageing 2018; Hong Kong Research Council Grant reviewer 2015-present; Member of the Economic and Social Research Council (ESRC) Commissioning Panel for the Ways of Being in a Digital Age Scoping Review, June 2016; Member of the European Internet of Things Council 2015-present; Editorial board member for 11 peer-reviewed journals e.g., Transactions on Leading-edge Synergistic Robots (MIT) and Journal of Advanced Internet of Things (Columbia International Publishers), reviewer/referee for 25 others (including 9 IET/IEEE/ACM); Conference Chair/Co-Chair for 7 International conferences; 9 keynote addresses; 21 PhD completions since 2009; 17 external PhD Vivas since 2008; Funded research from European Commission and various charities; European/Welsh Government Technocamps funding since 2015.

Houlden is an experienced IT professional, having spent his career in both public and private sector organisations. He has held lead/managerial technical roles for the NHS and private

companies, including the UK's data protection regulator, the ICO, where he was Head of Technology Policy for the United Kingdom. His close links to industry and policy are reflected in his role at Glyndwr of Readership under the route of research and knowledge transfer, engagement, and enterprise. He has worked closely with the National Cyber Security Centre (NCSC), the Open Data Institute (ODI), and many other influential groups, including the Turing institute to establish a research post in Artificial Intelligence (AI) for data privacy. In addition to presenting at International conferences on information security, he was also Technical Lead and Forensics Manager for the ICO investigation into Cambridge Analytica. He was also a Keynote speaker at the Wall Street Journal Cybersecurity executive forum and was an expert witness for first tier tribunals relating to the Freedom of Information Act (FOIA). He was the Chair Local Organising Committee and Editor for 3 International conferences, Administration and Social Events Manager for 5 International conferences. He was academic lead for two Knowledge Transfer Partnerships (KTP's) leading to new products with Trackyou, and was Secretary and co-founder of BCS Health in Wales specialist group (2010-2015). Currently working on a publication as Guest Editor for a Special Issue, Advanced Machine Learning and Data Mining: A New Frontier in Artificial Intelligence Research.

Picking was Chair of BCS Health in Wales specialist group (2010-2015), conference Chair of Internet Technologies and Applications Conference (ITA) 2013, 2015, and 2017, is a programme committee member for 11 International conferences. He has been on the editorial board of 3 journals during this REF period, e.g., CIT: The Journal of Computing and Information Technology, and Future Internet (Guest Editor), and on the review panel for a further 6 journals, including The Journal of Machine Vision and Applications. From 2016-19, he led the University's participation in the eHealth Eurocampus, an Erasmus+ Strategic Partnership project that researched new directions in eHealth training and education (www.ehealtheurocampus.eu). He has 14 PhD completions since 2009, has supervised 2 KTPs, and worked on several UK & EU-funded projects e.g., Easyline+, KEF Care in Business, POWIS (Prince of Wales Innovation Scholarships), Innovate UK (SBRI): Mobile Analysis and Support Companion for Occupational Therapy (MASCOT) 2015, and Memorytracks 2018 (https://www.memorytracks.co.uk). In these projects, he has collaborations with Universities of Aston, UIB Mallorca, UPC Barcelona, University of Montpelier, Hochshule Ulm, ISIS Castres, and Manchester Metropolitan University.

Pike is a Principal Lecturer and Professional Lead in Nursing. She specializes in research design, advanced clinical practice, professional practice, research methods, and curriculum development. In the context of UoA11, she has been partnering with her Computing colleagues in investigating the effect of robot pets on wellbeing for people with dementia, with collaborations with University of South Wales, Manchester Metropolitan University, and Staffordshire University.