

Institution: University of West London
Unit of Assessment: 33 - Music, Drama, Dance, Performing Arts, Film and Screen Studies
<p>1. Unit context and structure, research and impact strategy</p> <p>1.1 Context and research approach</p> <p>All the researchers in UoA33 are situated in the London College of Music (LCM) which is one of the three colleges, alongside six schools, that make up the University of West London (UWL). LCM was founded as a conservatoire in 1887. It is led by Professor Nicholas McKay as Director. LCM's research focus has been on practice-based research (involving the creation/development of artefacts or performances as part of the research methodology), and practice-led research (concerned with understanding practice more generally and thus referencing other people's practice). These methodological approaches can be sub-divided into three main areas that constitute this 2021 REF submission: music production, musicology and composition.</p> <p>Historically, those have been strategic research area for music research, and LCM has steadily increased its research profile in these areas, as evidenced by our submission to UoA67 in RAE2008 and UoA33 in REF2014. Over the REF2021 period, UWL has invested in facilities, expanded infrastructure, and increased funded opportunities for doctoral education (see institutional statement, section 2.1), and we have benefited from this. UoA33 is submitting 6.9 FTE researchers (4.5FTE in REF2014); with a research income of c£250k (vs £30k in REF2014), having awarded 11 doctoral awards (vs 2 in REF14). LCM has also proactively nurtured and supported junior colleagues to embrace research and scholarship, in order to build capacity towards the next REF, and beyond.</p> <p>1.2 Structure of the unit</p> <p>This UoA is submitting eight members of staff (two on fractional appointments), of which six (McKay [at Canterbury Christ Church], Osbon, Paterson, Zagorski-Thomas, Sholl and Pott) were submitted in 2014, and two new members of staff (Exarchos and Efthymiou). This submission includes six professors, one senior lecturer, and one lecturer.</p> <p>Research groups</p> <p>Our Practice Research Group currently involves staff from composition, performance, musical theatre and record production (including Efthymiou, Exarchos, Osbon, Paterson, Pott and Zagorski-Thomas). This group works closely with three larger national and international research networks – all founded under the impetus of UoA33 (see 4.3). It is driven by a common theoretical stance and encapsulates the practice-specific groupings of production, musicology and composition. Each group operates and embeds future sustainability on four principal trajectories: researchers, next-generation scholars, industry practitioners and postgraduate research (PGR) students, and involves a mix of those. Our PGR students work in the areas of performance practice, pedagogy, collaborative creativity and historical musicology.</p> <p>Production researchers Exarchos, Paterson and Zagorski-Thomas work within this grouping to address both overlapping and contiguous areas of research. Exarchos is primarily an autoethnographic researcher investigating sampling technologies and cultural theory within Hip-Hop. His research focuses on intertextuality and phonographic practice. Paterson has been working for six years on artificial-intelligence-based approaches to audio mixing using his 'variPlay' apps (one of the UoA33 impact case-studies) which has led to his current work on haptic control of sound in mixed reality. Zagorski-Thomas is engaged with analytical work on 'sonic cartoons' and ways in which production techniques suggest musical meanings (the second UoA33 impact case-study). His more recent work bears on 'practical musicology' and examines research about</p>

– and through – creative practice. Junior colleagues, and PGRs in LCM also share related research interests.

Musicology research is focused on twentieth-century music, investigated through analytic, aesthetic, hermeneutic, historical, semantic and semiotic methodologies, including practice-based approaches with composer-specific expertise, principally in the works of Stravinsky (**McKay**), and Messiaen and Pärt (**Sholl**).

Composition research bears on contemporary reinventions of methods and models of composition from past centuries. **Efthymiou** employs early 15th century Hispanic liturgical settings exploring stasis through melisma. **Osbon** extends and transforms mid-late 20th century compositional harmonic languages through systems of closed chordal arrays. **Pott** focuses on works testing the limits of reconceived 15th and 16th-century contrapuntal techniques. Our research students are composing in a broad range of styles and musical traditions.

These three research groups are all closely related to the 'Policy and Practice Research Institute of Screen and Music' (PRISM), an interdisciplinary 'music and screen' research centre created in 2017 to support both UoA33 and UoA34 (see 3.2.1). It proactively fosters a common interdisciplinary approach combining musical analysis, historical phono-musicology, new technologies, and science and technology studies.

1.3 Research and impact strategies

1.3.1 Post-2014 strategy

LCM's strategy was based on the University's review of REF2014 (see institutional statement section 2.1) with four objectives to deliver quality, growth and engagement with the music industry:

A) To consolidate areas of research through research income and expansion of international and interdisciplinary networks

Members of the UoA have led the development of a collegiate structure (through a strong mentoring and review scheme described in 2.2.1) to support and extend publication, bids for funding, and activities which facilitate and enhance connectivity with international research communities, and this has generated an impetus – and increment – in scholarly and research activity across the unit. Beyond just publication, it has precipitated increases in research income and PGR students, and UoA33's increased engagement with research networks is detailed in section 4.

Collectively, these activities have consolidated the UoA's standing in the sector and helped to encourage some 20+ members of LCM staff and PGR students to extend their horizons by producing outputs via these communities.

B) To develop colleagues' potential for sustainability

Over the assessment period, four permanent staff and five hourly paid lecturers have commenced or completed PhD studies– again, with mentorship and supervision from colleagues, and time allocated for study. This has more than doubled LCM's research-degree supervision capacity. Four new Professors (McKay, Paterson, Sholl and Zagorski-Thomas) were appointed/promoted over the period. Three Seed-funding Grants were secured by this UoA, in which UoA33 members partnered with junior colleagues to initiate music projects (see 3.1).

C) To enhance the impact of UoA33 research activities

LCM's strategy to grow industry engagement and sponsorships has been to utilise internal investments, strengthen extant industry networks, and increase external funding. LCM has engaged with creative, technical and industry partners in the performing arts and music industry to host, for example, public debates and Q&A sessions between members of UoA33 and high-

profile professional practitioners. Recent examples have included Kwami Kwaten, Simon Raymonde and Andrew Scheps. Over the period, approximately twenty-five such events have been run.

This activity has been supported by:

- School-level funding to bring in industry professionals – e.g., Bebe Rexha
- Strategic use of honorary awards to align with research strategies – e.g., Spike Stent
- Research-based engagement with instrument and technology manufacturers who supply (or wish to supply) equipment – e.g., Audient
- Theorisation of record production to improve industry training and knowledge dissemination – e.g., Jan Kybert

Sections 3 and 4 provide more detail about UoA33's work with industry partners.

D] **To enrich research culture within LCM**

PRISM and the Practice Research Group have significantly contributed to enriching the environment within LCM. PRISM was established as a research centre to provide a hub for creative research in an interdisciplinary context, and opportunities for engagement with external stakeholders, staff and PGR students. The Centre has recruited and promoted world-class researchers.

The Practice Research Group was inaugurated in 2015 and has twelve regular members, and a number of additional colleagues who contribute to some of the events the group promotes. The researchers involved in the UoA have worked extensively to build strong links with national and international research communities through new and existing research networks and scholarly associations. Further, their leadership roles in these international research communities have enriched the research culture at LCM, fostering engagement from a new generation of LCM's staff and PGR students, and raising the profile of LCM's areas of research excellence.

LCM has engaged frequently with these international networks (see 4.3) and has fostered new links for UoA33's PGR students (see 2.3) – through which they subsequently published. These activities continue to be supported by a central LCM budget for bespoke investment in equipment and conference attendance.

1.3.2 Impact Case Studies

The submission includes two impact case studies. One demonstrates how Zagorski-Thomas' concept of sonic cartoons, which provides an enhanced theoretical model for considering the schematic nature of recorded music, has been widely adopted in recording arts pedagogy in many countries, as well as influenced sound engineers, musicians and record producers. Zagorski-Thomas' research has reached an influential industry audience through the annual Art of Record Production conference, as well as the public through his eight-part radio series *How the World Changed Music*, commissioned by the BBC World Service and broadcast in 2019.

The other impact case study shows how Paterson's AHRC-funded research led to the development of an iOS app-format called variPlay which enabled listeners to manipulate musical content as it is played, to hear a unique version – effectively a remix – every time. The app had commercial impact through collaboration with Warner Music Group and the British Phonographic Institute, and several international artists released music in this format. The project greatly extended understanding of relevant commercial issues in the wider use of interactive music. There has also been impact on creativity through the artists engaged with the project, and on public appreciation of the potential of interactive music.

1.4 Strategy 2020-25

LCM will broaden its research base by increasing the proportion of research-active staff. Research in subject areas with active portfolios will be expanded; research is currently being developed in the area of performing arts, which has great potential for expansion and is starting to generate its first publications.

LCM's high-level objectives are to future-proof and diversify the research base through strategic recruitment and develop next-generation researchers toward the next REF and beyond. Further, the research culture will be further enhanced across LCM's existing and emerging subjects. We will increase IPR, and our volume of research students (see institutional statement, section 2.2). Impact will continue to be prioritised, engaging researcher users through our industry links.

The five-year LCM research strategy is designed to foster this expansion process through five principal mechanisms. Firstly, by continuing to apply (and enhance) inclusive governance mechanisms – particularly regarding sabbaticals and other research investment. This will build staff engagement through a tailored program of staff development using flexible approaches to workload management; it will be delivered by setting structured and rolling staff-research targets via annual appraisal. UoA33 will work with PGT and PGR students to continue to enhance LCM's research community and its visibility, with an ambitious plan to build upon extant key roles in national and international communities to extend this profile. All research-oriented staff mentoring will focus on bid applications, impact, and dissemination activities. Research will be further embedded into the curriculum via student involvement in research projects – assisting with data collection and preliminary analysis – and providing a pipeline towards doctoral studies.

1.5 Support for standards and ethics

1.5.1 Academic research infrastructure to support standards

The University Research, Scholarship and Enterprise Committee (URSEC) meets three times a year, and its activities and structure are outlined in our REF 2021 Code of Practice. **Osbon** and **Paterson** currently serve on this committee for UoA33, submitting regular updates and an annual report of LCM's research, enterprise and scholarly activities, and also feeding back to the school. A University Research Degrees Sub-Committee (with the same representation from UoA33) oversees progression of postgraduate research students to registration to MPhil status, and onward to doctoral completion.

1.5.2 Ethics

Research ethics applications are overseen by the University Research Ethics Committee (UREC), a subcommittee of URSEC with **Paterson** as LCM representative. It monitors all research projects (including undergraduates'). The School/College Research Ethics Panel (SCREP) scrutinises research ethics applications and regularly reports to UREC. **Zagorski-Thomas** is the current chair of LCM's SCREP. Student support for these applications is provided by supervisors, and the Graduate School for PGRs. A subpanel of UREC oversees all high-risk applications.

1.6 Interdisciplinarity within UoA33

Interdisciplinarity at the interface between music with science and technology is central to UoA33; e.g., in research on record production and the development of technologies for embedding music into new media through spatial audio and interactivity. **Paterson's** AHRC-funded variPlay app and HAPPIE projects employed AI and haptic technology. **Zagorski-Thomas' 'Classical Music Hyper-Production'** and **Exarchos'** sampling technologies in Hip-Hop production both explore areas of crossover between cultural musicology, music cognition and science and technology studies.

Several PGR students are also working on the integration of music and technology e.g., via electronic composition, enhanced performance and dissemination techniques.

1.7 Open Research Environment

The Library has been encouraging and supporting authors to use open-data repositories to archive their research data. **Paterson**'s collaborative work on a haptic-audio control protocol, similar to the MIDI protocol for digital instruments, contributes to industry standardisation and the effective sharing and management of research data between projects internationally. **Exarchos**, **Paterson** and **Zagorski-Thomas** have taken leading roles in developing new models of open access proceedings publication models – often based on public platforms such as Vimeo, YouTube and WordPress:

- <https://www.arjournal.com/asarpwp/>
- <https://london-calling-iaspm2020.com/previous-sessions/>
- <https://www.inmusicconference.com/home>
- <https://mupact.com/seminar-program-may-jul-2020/>
- <http://www.c21mp.org/practice-research-publications/>

2. People

2.1 Staffing Strategy

The University Academic Employment Framework (AEF) was set-up in 2015 to provide a formal structure for the management, development and support of all staff (see institutional statement section 3.1). Staff can focus (in addition to teaching) on research, scholarship and/ or knowledge exchange activities. Agreed research targets form part of annual staff appraisals, with opportunities to transition overtime between research, enterprise and scholarship activities; a process supported by our mentoring scheme (see 2.1.1).

The AEF has enabled UoA33 to strategically recruit, develop and retain established world-leading researchers. The AEF articulates work-loading models with ring-fenced research time, enabling the LCM staffing strategy to better calibrate the balance of practical, educational, and research expertise – consciously increasing the latter. LCM's approach has been to strengthen established areas of research excellence and to invest in emergent areas, and with reference to the impact strategy (see 1.3.1 C). New appointments were based on excellent research track-records and future potential. Over the past three years, high-profile research academics have been appointed in each research group: **McKay** (musicology), **Efthymiou** (composition) and **Exarchos** (production). Junior colleagues with strong research potential have also been appointed in musical theatre, music management and musicology establishing a broader research base for the future.

LCM promotes a culture where academic staff and PGR students are encouraged to undertake collaborative research projects, fostering publications and creative outputs in projects such as the 'Hyper-Production' recordings, HAPPIE, variPlay, and the immersive audio-visual installations for Afro-Cuban music, for example.

The growth in research activity since 2014 has been supported by the University's staff development and student funding, and by staff themselves who were keen to build this community. As indicated in the institutional statement section 3.2, there are formal mechanisms to support research development both at university level, and within the College.

2.1.1 LCM support

LCM instigated a research-mentoring scheme in 2017. Nine senior academics have been assigned as mentors to academic staff. They meet with their mentee on a one-to-one on a quarterly basis to discuss and monitor research/scholarship and enterprise plans. They act both

as pre-publication 'critical friends'/second readers and collaborative research authors/investigators. For example, **Paterson** mentored a colleague to co-author his first paper, published by the Audio Engineering Society (AES) in 2019, and **Osbon** mentored a colleague as a co-collaborator on 'Follow the Sun', a multimedia performance output. All UoA members also serve as cross-disciplinary mentors for staff in other Schools/Colleges within UWL where relevant. Members of UoA33 also provide direct support for junior staff.

LCM's research seminars include sessions on research skills (including the effective communication of research narrative in practice-as-research outputs, specialist bid-writing advice, or PhD supervision) and subject-specific presentation (e.g., a series of visiting international academic speakers, including Michael Spitzer, Nicholas Cook and Alan Williams, run between 2014 and the start of the 2020 lockdown). Under COVID-19, LCM established an online collaborative fortnightly research seminar series – 'Music Production and Creative Technology' (MuPaCT) – with music and technology departments at the universities of Coventry, East London, Huddersfield, Leeds Beckett and Salford, combining presentations of research-in-progress with extended discussions (May-July 2020). Over the REF period, UoA33 composers run weekly composers' workshops during term time (which continued online during the pandemic), alternating between presentations by LCM staff and visiting composers including John Cameron, Param Vir, and Judith Bingham. Through its leadership of the 21st Century Music Practice Research (C21MP) network, LCM organised and hosted a study day on 'Publishing Practice-Research Effectively' in December 2019. This was attended by research practitioners from 21 UK HEIs and two online symposia followed, exploring practice-as-research working methods and theoretical frameworks.

2.1.2 University-level support

The University has an Impact Group that has provided advice and review opportunities; it has also provided guidance on REF and the REF Code of Practice. Eight staff, including four UoA members, have presented at the annual University Research Conference and three have published in the UWL open press journal *New Vistas* (see institutional statement 2.1, point 4).

Research and Enterprise Operations Services (REOps) has offered support for research-funding applications. All members of UoA33 have attended associated events and REOps has provided invaluable support for UoA33 bid writers.

Since 2014, three staff in LCM have completed UWL doctorates (with a 100 hours per annum reduction in their workload). One other is currently in progress. Five former (completed) doctoral students are currently employed by LCM as hourly paid lecturers. Members of UoA33 have been supported via HR budgets for training and attendance at over fifty international conferences. LCM has also run eleven conferences at UWL, ranging in scale from small colloquia to the large international music conferences, e.g.: Innovation in Music (InMusic) in 2019 and the 2020 UK and Ireland International Association for the Study of Popular Music (IASPM) conference, *London Calling* (online due to pandemic).

The Communications department offers advice on media; public engagement; engaging with diverse audiences; social media; and lobbying. Its Research Communications group meets monthly to strategize media exposure for its research; this UoA is represented on this group (**Caston**). The Library has provided training and one-to-one support on Open Access and compliance and LCM staff have added 442 items to the repository since 2014. All UoA33 members have ORCID IDs.

2.1.3 Research Centre

The 'Policy and Practice Research Institute of Screen and Music' PRISM (see 1.2 and 3.2.1) plays a key role in providing a clear and sustainable structure for research, by providing an annual programme of activities supported by the centre's established researchers. This inclusive programme (targeted within UoA33 and 34 but open to all UWL PGR students and junior

researchers) is regularly reviewed to ensure it evolves according to students' needs. External invited speakers are publicised via the relevant scholarly associations. The programme includes webinars held twice a semester in which PRISM hosts established UWL researchers, external guest-academic speakers and/or final-year graduate students; with sessions on various pertinent methodologies, in-depth interviewing, hermeneutics, the de-colonialisation of research methodologies, for example. It includes research skills and research management, and discussions of papers pre-publication; and bi-semester research meetings, where doctoral students practice presenting; they get feedback that supports them for presentations they need to do as part of the PhD journey, and external presentations. We will be adding this year an annual PRISM symposium (in addition to the LCM Student Research Conference – see below, section 2.2.1) to give students the opportunity to present the results of their research to a cross-school audience of staff and students. This all-day event has been supported by LCM and the UoA34 School.

2.2 Research students

2.2.1 Opportunity

As explained in the institutional statement section 1, the University's mission is to provide opportunities to all, and to support all students in achieving their ambitions. One of the vehicles for this is a three-year-long Vice-Chancellor's PhD scholarships scheme, to provide access to students who may not otherwise have been able to access doctoral education. These are awarded on a competitive basis, and have enabled nine LCM students to access doctoral study and qualifications since 2016. LCM has also offered fee-waivers which currently support a further six. Doctoral students have opportunities to teach wherever possible (to a maximum of six hours per week, including preparation). Seven have taught on undergraduate programs with a further four starting in February 2021.

UoA33 students are encouraged to present and network in varied environments, fuelling a thriving postgraduate community of over 120 students. These include the annual LCM PGT/PGR Student Research conference involving over 100 students with mock presentations to UoA members and peers. Central funding supports students to attend both regional PGR conferences (including the Westminster-Goldsmiths Symposia for Research in Popular Music) and national/international conferences including the Art of Record Production (ARP), AES, IASPM, InMusic, Performance Studies Network and the Royal Musical Association (RMA). Sixteen of our research students have received travel grants; over the period, they have published six articles in discipline-specific journals, two in *New Vistas* (see section 2.1.2 with reference to staff publishing) and five book chapters.

2.2.2 Training

UoA33 members run regular research seminars for PGR students dealing with methodological or subject-specific issues. These include practice-as-research and a music-focused seminar on reference management software. Concurrently, our students attend a formal centrally run research training programme (see institutional statement, section 3.2) based on the *VITAE Framework* which covers all aspects of the research process. It is run by the Graduate School, with contributions from senior academics from across the institution. It comprises a complete series of Research Development Units (RDU) with embedded Epigeum interactive online activities. It runs throughout the period of study (intensely in the first year), with contributions from senior academics from across the institution. It covers all aspects of research and research development and includes several opportunities for students to present their research. Examples of training topics include research philosophies and methodologies; literature review for PhD; research ethics and research integrity; managing your research project; achieving impact; writing for publication; identifying and dealing with predatory online journals. The Graduate School also runs the annual

Doctoral Conference which is very well attended by UoA33, LCM colleagues, and students. All PGR students present papers, including three recent prize winners: two best papers (2018 and 2020) and a runner-up (2017).

2.2.3 Supervision

The Graduate School oversees the training of all supervisors across the University, and provides administrative support for the student journey (see institutional statement section 3.2). Zagorski-Thomas and Paterson contribute as facilitators to these university-wide sessions. Supervisor training is mandatory and takes place annually. Supervision teams are designed to combine subject expertise and experience in mentoring, academic and pastoral support based upon the 'VITAE' framework. This is managed for LCM by Osbon as Head of Postgraduate Studies. UoA33 ensures the quality of training and supervision of PGR students is guided by the University's 'Code of Practice for Research Students and Supervisors' which outlines the University's approach to supervision and doctoral education (see institutional statement, section 3.2).

2.2.4 Progression

One of UWL's priorities (see institutional statement section 3.2) has been to support PhD students towards completion within 3 to 3.5 years, and this is supported through mechanisms that enable student progression -monthly supervision meetings, regular updates, annual reports, and opportunities to speak directly to the Graduate School for extra support. An emergency pandemic support plan was put in place in 2020 for students who needed additional time, advice, or resources, to ensure their progression was not compromised. Pastoral advice is provided through the University's central student-support services. Students appreciate this structured support and have ranked UWL 7th out of 103 institutions on progression in Postgraduate Research Experience Survey (PRES) 2020.

2.3 Equality and Diversity

LCM are deploying considerable efforts to redress the socio-economic diversity imbalance that is well known in this subject (according to the annual UWL 'Education Review' data, 26% of UoA33 students across all courses are from BAME backgrounds and 35% are mature, whilst the PGR student cohort comprises 89% mature students). The student cohorts in LCM reflect the highly diverse nature of UWL. LCM is positively encouraging students from all socio-demographic backgrounds to engage with doctoral studies (three of the nine Vice-Chancellor's PhD Scholarships in LCM were awarded to BAME students).

LCM works pro-actively to expose students to diversity. PhD topics include non-European-based musical traditions; seminars and masterclasses - including industry speakers - are organised to reflect cultural diversity. Staff proactively include examples of repertoire that counter the white, male heterosexual canon that has established itself within the narratives of western musical creativity. Both staff and students are engaged with the cross-organisational Equality, Diversity and Inclusion in Music Studies Network. There is a strong representation of LGBTQ+ staff in LCM which sends a powerful message about support, tolerance, and comfort to students, and which is also reflected in the repertoire selections. In 2019, LCM appointed an Equality and Diversity Lead, who coordinates regular events, such as 'Shared Experience', a PhD-student-led contribution to Black History Month. Following the University policy on Equality and Diversity, staff receive regular training on recruitment, promotion, and appraisal.

The University also provides formal channels to ensure positive engagement with this agenda as below:

2.3.1 Training

HR deliver a mandatory programme of face-to-face and online training on all aspects of equality and diversity which has been attended by all UoA33 members. Supervisors have been trained on these issues through the compulsory training run by the Graduate School.

2.3.2 Research-development opportunities

Research-development opportunities available to staff always state criteria for selection and there is a transparent application process. Access to other research support, such as conference attendance support, sabbaticals and 'seed funding' follow established procedures and are open to all staff that meet the relevant criteria. Applicants are provided with relevant advice and a clear written description of the protocol to apply. As previously mentioned, UoA33 has significantly benefited from these opportunities.

2.3.3. Recruitment and progression of research students

Both recruitment of doctoral students and the award of the Vice-Chancellor's PhD Scholarships are based upon policies that specify entry requirements. Applications are supported by a written statement and interview by a panel including supervisors and a Graduate School representative, to ensure fairness and consistency across the institution. Progression is monitored by the Graduate School through a set of staggered milestones, and both registration and transfer to PhD status is confirmed by the University Research Degree Sub-Committee.

2.3.4 REF

UoA33 reviewers received training on equality, diversity, and unconscious bias to support them in supporting the REF submission. We also discussed REF processes, and the Code of Practice at a number of REF meetings.

3. Income, infrastructure and facilities**3.1 Income**

We have relied on external and internal bids to secure research income.

3.1.1 Internal

Three seed-funding projects led by staff in UoA33 were supported by the University (£9000):

- *The Cuban Music Project* (**Zagorski-Thomas** with junior researcher)
- 'Creating and disseminating contemporary electronic music for commercial immersive-sound formats' (**Exarchos** with junior researcher)
- *Towards A Paradigm of New Musical Performance* (**Paterson**)

From this, **Paterson** then developed this pilot work into the 'HAPPIE' project (below) – setting up a dedicated lab.

3.1.2 External

- **Paterson** (Co-I) *Transforming Digital Music: Investigating Interactive Playback*; 2014-2015; **£31,933** (£64,159 project total). AHRC – AH/M002535/1.
- **Zagorski-Thomas** (PI); *Classical Music 'Hyper-Production' and Practice-As-Research*; 2015; **£40,101**. AHRC – AH/M010155/1
- **Paterson** (PI) *The Commercialisation of Interactive Music*; 2018-2019; **£72,224**. AHRC – AH/R004757/1.
- **Paterson** (PI) *HAPPIE: Haptic Authoring Pipeline for the Production of Immersive Experiences*; 2019-2021; **£113,307** (£782,921 project total). Innovate UK – 105159.

(At the time of writing, the project timeframe is being extended beyond the current REF period with an extra **£42,000** for UWL, due to COVID impact restricting access to the 'HAPPIE Lab' during lockdown).

These funds accelerated the generation of research outputs, e.g.:

- **Paterson, J. L., Toulson, E. R. and Hepworth-Sawyer, R. (2019)** 'User-Influenced/Machine-Controlled Playback: The variPlay Music App Format for Interactive Recorded Music', *Arts*, 8(3), p. 112. doi: 10.3390/arts8030112.
- **Zagorski-Thomas S. (2015)** Haydn Piano Sonata XVI: 50 – Hyper Production MIDI Version: <https://vimeo.com/140241973> (Accessed 19th Feb 2021)

3.1.3 Additional sources of funding

Pott and Efthymiou were (separately) awarded £57,500 over 15 composition commissions. Collectively, all

The income enhanced the visibility of UoA33 research – internally, and externally - to establish UoA33 amongst the international community of music scholars. These awards also developed the professional expertise and esteem of the investigators and their collaborators. This has led to new research partnerships, for example Paterson's £2.3m bid (under review at the time of writing) with UCL and King's College London medical schools, RNIB, BBC and others. Further, the directly allocated elements of the funding created impactful employment, e.g., a full-time research assistant (RA) in the 'HAPPIE' project, and sixteen professional musicians in the 'Creative Recording in Lockdown' project.

3.2 Infrastructure

3.2.1 PRISM

The PRISM research institute has a focus on the creative industries. It was formed in 2017 and has been central to increasing visibility for its research areas, acting as a research hub for both UoA33 and UoA 34. Led by Professor Emily Caston, this interdisciplinary research and consultancy centre has 20+ academic members. It has used its status as operating from the very same site as the old Ealing School of Art, and its famous creative alumni (Tony Palmer, Samantha Stevens, Freddie Mercury, Ronnie Wood, Pete Townshend) to bring together research that focuses on music, film, and TV, supporting researchers that conduct interdisciplinary research outside the dominant singular paradigms. PRISM's members all have expertise in partnering with non-HE organisations for research.

3.3 Facilities

UWL has also significantly invested in state-of-the-art laboratories and specialist facilities, providing LCM with extensive high-quality studio and performance facilities. These include three concert halls, eighteen recording studios, three Mac labs, two modular-synthesizer rooms, four performance/dance studios, five band-rehearsal rooms, twenty-one teaching and practice rooms, plus access to St Mary's church. The church has hosted several research-composition outputs, and several members of staff have conducted experimental 3-D-audio recordings in it – subsequently documented in published articles. There is a media-resource centre with an extensive stock of professional-level recording, live-sound and video equipment – with highly specialised items such as several modular synthesizers and a 'dummy head' microphone. LCM is sponsored as an 'All-Steinway School', one of only eight UK HEIs and conservatoires to currently hold this status – with 37 pianos. LCM has Europe's largest Focusrite® RedNet system and Dante integration across the site, allowing audio to be streamed and recorded between all studios, concert halls and production rooms. There are three different immersive-audio studios using 13.1 and 7.1.4 Dolby Atmos® speaker arrays, and 3-D audio playback is facilitated in two of the concert

halls. These facilities support a diverse range of research activities when either used individually or when hybridised.

One example was at the 2019 InMusic conference when Paterson led a team of 20 to produce a keynote performance by the 'Radio Science Orchestra'. In collaboration with Edinburgh Napier University and Focusrite® Ltd, they achieved a world-first performance by performing live from different studios around the London campus alongside musicians in Edinburgh over JANET, with high-quality bidirectional audio/video – synchronised by GPS clocking via satellite. The resulting audio was diffused in 3-D in an LCM concert hall, with multiple synchronised video feeds from all locations 'VJ-ed' onto the audience of delegates – acting as moving human pixels. The concert was recorded binaurally using the dummy head. Following the event, top rock bands 'Coldplay' and 'Rage Against the Machine' contacted the team to ask if/how they could deploy the same technological innovation.

Another example was when the 'Classical Music Hyper Production' project in 2015 used numerous recording studios and performance spaces, connected by the RedNet system to form a unique extended recording environment. This also involved taking recording equipment to London venue Wigmore Hall for binaural capture. This project involved six members of teaching/research staff, four technicians and two doctoral students, plus research partners from Oxford University and Royal Academy of Music (RAM).

3.3.1 Further research applications derived from facilities

The following facilities are ring-fenced for research, postgraduate and doctoral use and have been used to complete much of the research in UoA33, with examples as follows.

The Innovate-UK-funded HAPPIE Lab is a haptics-plus-audio virtual and mixed-reality laboratory. Used primarily by Paterson and his RA for the HAPPIE project, two of his PhD students engaged in virtual-reality-related projects, also benefit from access to these facilities. Haptics company Generic Robotics Ltd have provided £30k of Geomagic® Phantom hardware for ongoing research and are, in return, allowed to stage demonstrations in the room for their London client base. The laboratory also hosts devices such as the Microsoft HoloLens2 and a further Dolby Atmos® 3-D playback system. These systems collectively provide haptic feedback from a mixed-reality visualisation that exerts control over audio spatialisation and production – key research objectives of the HAPPIE project. (Project partners: Generic Robotics Ltd, Numerion Software Ltd, Open University, Sliced Bread Animation Ltd, The Science Museum Group.)

Vestry Studio 1 features a Custom Series-75 Neve console, an Otari MTR90 Mk2 24-track 2" analogue tape-recorder, and Pro Tools HDX with Apogee Symphony AD/DA and monitoring by ATC and Amphion. The room features extensive outboard hardware – including vintage gear from Amek, Urei, AMS and more, and a microphone selection including models by Neumann, DPA, Coles, AKG and Beyer. It has been extensively used for various research projects. For example, Exarchos has been preparing a monograph that discusses the origin of the 'vintage' audio samples commonly employed in rap music, and this studio has allowed him to 'reverse-engineer' these in order to form a taxonomical framework of their attributes. This studio produced the data for his paper: '(Re)Engineering the Cultural Object: Sonic Pasts in Hip-Hop's Future'.

Vestry Studio 2 features both 13:1 and 7.1.4 3-D-audio systems for immersive-audio research and production. Examples include Paterson, who utilised this specialist resource to emulate a 3-D sonic space in which to manipulate and play virtual-reality models of acoustic musical-instruments in the project 'Towards A Paradigm of New Musical Performance' (see 3.1.1), and several PGR students have used this studio to gather data for their theses.

Throughout 2020, recording sessions were feeding into Zagorski-Thomas' extended 'sonic cartoons' and C21MP research projects. These included four staff, and both PGT and PGR students, and work included recording and filming Byron Wallen's 5-piece band for the 'Hurricane

Bells' project. Further, both a RAM PhD student's piece 'L'Enharmonique', and the 'Failing Upwards' album project with Winston Clifford, Jasmine Keyser, Jeanette Mason, Wells Gordon, Kiambu Kasongo and others, were used for the 'Hyper Production' project (also slowed down by COVID).

LCM also hosts a range of specialist equipment, including high-end microphones, Datapath video splitters, a 14-channel EEG sensor system, a HoloLens2 and outboard audio equipment that were funded through previous AHRC and other research projects. Such equipment represents a rich, adaptable and powerful tool set for LCM and has facilitated numerous specialist publications.

3.3.2 Cross-institutional facilities interaction

'Ealing Music and Film Festival' utilises these world-class facilities for public events curated by its Artistic Director McKay. In addition to access to the above, doctoral students have been supported in projects which required access to equipment from other institutions or commercial facilities, demonstrating the extendibility of UoA33 data-collection ethos and how its environment stretches beyond local and national geographical boundaries. These have included performances and recordings in King's Place, Ministry of Sound, Mimi's of Mayfair, Pharmacy Studios (USA), Prince-Bishop of Wroclaw's palace (Poland), and the immersive speaker-dome in the Royal College of Music (Sweden). These collectively involve technologically enhanced performance practice, immersive audio, historical re-enactment of recordings and experimental record production techniques.

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

4.1 Collaborations

Much of the UoA's success in research has been realised via collaborations. LCM collaborates with other disciplines and UWL UoAs (e.g., work with the 'Geller Institute of Ageing and Memory' in the 'music and dementia' project – see 3.1.1) Externally, there is sustained engagement with both academia and industry, both at national and international levels. The research grants in which LCM participates are multi-institutional and involve industry collaborations. All such collaborations are carefully monitored by the School Executive. This includes the vetting of funding applications, budget reporting and progress reports to ensure that appropriate support can always be provided.

Efthymiou has worked with numerous partners for new compositions, concerts and recordings from 2014 to the present. These include New Music in the South West; the Bristol Ensemble; Royal West of England Academy; Hauser and Wirth Museum; the Manon Quartet at Royal Albert Hall's Elgar Room; the Ligeti Quartet at Lincoln Performing Arts Centre (USA); Homerton College, Cambridge; the Phacelia Ensemble (Germany); Ensemble Variances at the Victoria Rooms, Bristol with the University of Bristol Symphony Orchestra.

McKay was an elected member of Council on the RMA, working on international music-research conferences, study days, research funding and national strategy in 2014; this was before joining UWL in March 2019. In leadership roles, he has collaborated closely with Canterbury Festival (2014-2019) and Ealing Music and Film Festival (2019-present) promoting and commissioning creative arts research work for those major festivals.

Osbon initiated a tripartite transmedia performance with Rowan University, (USA) and Kingston University entitled 'Follow the Sun' (2015-present). The project outputs were a peer-reviewed journal article (2016), a conference paper (2017) at the National Association for Music Education, a webcast performance (2017), and a musical collaboration with the Anglo-American Duo. There were further performances in the UK, USA, Italy, Austria, Hungary, Greece and The Netherlands, plus broadcasts in the USA, Italy and The Netherlands. A CD recording was released in the USA. For the variPlay project, **Paterson** firstly collaborated with Anglia Ruskin University in 2015 and then the AHRC-invited application for 'Follow-on Funding for Impact and Engagement' with the

University of Westminster in 2017 (see 3.1.2). The project produced impact via seven variPlay iOS apps, some with Warner Music Group, several joint-authored publications, thousands of app downloads and tens of millions of music streams around the world. Since 2019 (to the present), his collaborative HAPPIE project (see 1.2) attracted an invited presentation to the Parliamentary Education Committee. Innovate UK requested an application for follow-on funding, and the UK Creative Economy Team invited and funded the project to represent UK research by exhibiting at South by Southwest (SXSW) festival in USA.

He was invited to represent UK research on AI in music in the AHRC delegation to Shanghai, China in April 2019 and its subsequent reciprocal event in London. Other delegates included QMUL, University of Nottingham and Steinberg. He gave an invited presentation to the University of Cambridge in 2017. He has written and submitted research bids on interactive music, AI and immersive-audio projects with partners that include: Abbey Road Studios, RNIB, Sony Interactive Entertainment, BBC, Melody VR, Ninja Tune Records, The Rattle; Skywalker Sound (USA); Alibaba, Beijing DeepMusic Tech Co. Ltd, both Hubai and Palace Museums, Yunpuku Technology (China), Norwegian Planetarium, Valdresmusea, Trondheim Science Centre (Norway); Swedish Museum of Performing Arts, Libido Audio Industries (Sweden), and universities in China, Norway, UK and USA.

Pott has collaborated on performances and recording of new works with Commotio Chamber Choir; Toccata Classics; the choir of St Peter's Episcopalian Church (USA); Thomas Trotter at Manchester Cathedral for BBC Radio 3, Philharmonia Orchestra, Royal Festival Hall; Yuko Inoue for EMI Records; Saint Louis Chamber Chorus; the BBC Singers; the Uppsala Cathedral Choir at Uppsala Cathedral; Vasari Singers at Canterbury Cathedral; Chiesa di San Bernardino-Auditorium 'Manenti', Basilica di Santa Barbara, Università Cattolica del Sacro Cuore (Italy); Ripon Cathedral; and Merton College Chapel Choir. The success of these collaborations is evidenced by performances and recordings between 2014 and the present, and in 2020, the requiem for cello and double chorus, 'At First Light', was nominated in the 'Classical Compendium and Contemporary Classical Composition' category for a US Grammy Award.

Sholl worked with Arundel Cathedral, Notre-Dame Cathedral, Westminster Abbey, St John's Smith Square, Ealing Music and Film Festival, and the Guildhall School of Music and Drama, on organ performances and improvisations. The indicator of success is a sustained series of concerts from 2015 to 2020. As an author and editor, he has collaborated with King's College London and RAM.

In the 'Classical Music Hyper-Production' project (see 3.1.2), **Zagorski-Thomas** collaborated with performers and composers from the Akademia Muzyczna im Karola Lipińskiego (Poland), Harvard University, Hochschule der Künste (Switzerland), University of Oxford and RAM from 2015-2019. This project produced several articles, concerts, and recordings.

These collaborations are strategically linked to funding, either at bidding stage, or as a result of an award – UoA33 can attribute much of its research activity to these sustainable and symbiotic interactions. We always base the approach to partnership on mutual respect and inclusivity, and always ensures clear division of responsibilities based on expertise and clear collaborative planning. Strategically, the UoA takes a long-term approach to research collaborations to ensure that staff get to know their partners well and can develop sustainable relationships. An example is **Paterson's** work with a colleague (now of company RT 60) – their first FP7 bid was in 2009, and the most recent to Innovate UK in 2019, with two other successes in the REF21 period (see 3.1.2).

The above abundance of compositions/performances have enriched international musical culture, bringing the results of UoA33 research to the public at large. This was extended via world-wide media; several staff have appeared on international television and radio and discussed their research to audiences of tens of millions, e.g., **Exarchos**, **Paterson** and **Zagorski-Thomas**

appearing independently on the BBC World Service, and **Pott** on US TV. **McKay**, **Paterson**, **Pott**, **Sholl** and **Zagorski-Thomas** have given public talks e.g., at Festival No.6, Also Festival, Creative and Culture Exchange, Harrogate International Festival and Glyndebourne Touring Opera.

4.2 Networks

UoA33 staff are highly engaged with the leadership and governance of their research communities. **McKay** has been a member of the International Advisory Board at the Academy of Cultural Heritages (Helsinki/Athens) before joining UWL. **Paterson** is a founding partner of the biennial InMusic conference series (2013-present), a project creating an ongoing research community involving academics from around 40 universities in Europe and North America. **Sholl** is a Council Member of the Guild of Church Musicians, UK and an Academic Board Member of The Royal College of Organists, and convener of an RMA conference session in 2015. **Zagorski-Thomas** is chair of the IASPM UK and Ireland branch, and leading a community of 200 academics in 30 countries when he was co-chair of the Association for the Study of the Art of Record Production from 2009-2017. He is the founder and leader of the C21MP network involving 250 academics from 30 countries.

Since COVID-19, **Zagorski-Thomas** has continued to facilitate online networking by creating the online forum MuPaCT (see 2.2.1) with both UK and international participants. Along with the online IASPM events (see 2.2.1), this maintained this UoA's position as a leading music research group engaged with contemporary, industry-facing musical activity, even in adverse circumstances.

Collectively these events place UoA33 as a nexus of international research across multiple disciplines. Importantly this activity has emulated practice-led projects across the College, involving electronic dance-music, popular music, multimedia composition, sound installation, musical theatre, cabaret, opera in the subsidised arts and commercial music sectors, with partners from Australia, Bolivia, Bulgaria, Cuba, Czech Republic, Germany, the Netherlands, Poland, Spain, India, USA and the UK.

4.3 Wider activities and contributions to the research base, economy and society

Over the period, UoA members have served as convenors and programme chairs for the InMusic Conference (2015, 2017, 2019) and AES Conventions (2015, 2019) – **Paterson**; the International Association for Mission Studies (2017) – **Sholl**; the IASPM UK and Ireland branch conference (2020) and the ARP Conference (2014, 2015, 2016, 2017) – **Zagorski-Thomas**.

4.3.1 Reviewing and editing

UoA staff are highly active as reviewers and editors in their respective diverse research communities. In the Musicology research group, **Sholl** was guest editor of the *International Feldenkrais Federation Journal of Creative Practice* Vol VI (2019) and is a peer-reviewer for *Journal of the RMA*, *Journal of Musicology*, *Twentieth Century Music*, *Leonardo*, *Music and Letters*. He is also reviewer for AHRC, Social Sciences and Humanities Research Council of Canada, Australian Research Council and a book reviewer for Cambridge University Press, Routledge, Bloomsbury Methuen, and Indiana University Press.

In the Production group, **Paterson** is a peer-reviewer of both AHRC and EPSRC funding bids, an academic reviewer for AES, the Swiss National Science Foundation, InMusic (and he co-edits the accompanying book series, published by Routledge), and a book reviewer for Focal Press and Routledge. **Zagorski-Thomas** is Associate Editor on the IASPM Journal, series editor of the Cambridge University Press Elements series on C21MP and on the editorial board of the Cambridge Elements Popular Music series. He is a peer-reviewer for *Music and Letters*, *Popular Music*, *Journal on the Art of Record Production*, *the Polish Sociological Review*, *Technology and Culture*, *Acta Musicologica*, *Dancecult*, *Music Analysis*, *Musicae Scientiae* and *Technology and Culture*; and a book reviewer for Cambridge University Press, Routledge, Bloomsbury Academic

Press, Focal Press and Continuum Books. UoA33 members have edited eight book collections for Bloomsbury, Ashgate and Routledge.

In composition, **Osbon** is a member of the editorial panels for *The Body, Space and Technology Journal* and *NZ Review*.

4.3.2 Esteem

Finally, a range of indicators reflect the UoA's status nationally and internationally. **Osbon** was awarded the Franz Schubert International Composition Prize (2020), the Academia Musica Vienna International Music Prize (2020) and a New Symphony Vienna International Composition Diploma (2020). **Paterson** gave invited keynotes at the Music Tech Fest (Slovenia, 2015), the British Phonographic Institute (2018), and the Innovation in Music Conference (2019). **Pott** was awarded the 'distinguished achievement' Medal of the Royal College of Organists (2020). **Zagorski-Thomas** was the invited keynote at the Sonic Signatures Symposium (Denmark, 2014), the launch of the Ashgate series *Musical Cultures of the Twentieth Century* (Italy, 2016), the University of Huddersfield's Symposium on Practice-based Research in Popular Music (2017), the Performance Studies Network Study Day, Surrey University (2019) and the IASPM Latin America branch online conference (2020). He was awarded the IASPM book prize in 2016 and is a visiting professor at Popakademie Baden-Württemberg (Germany). His work on the Musicology of Record Production has had a profound influence on international approaches to higher education pedagogy with his monograph appearing in 1075 university libraries in 35 countries – a strong contribution to the sustainability of the discipline.