

<b>Institution: Birmingham City University</b>
<b>Unit of Assessment: UoA 35 Music, Drama, Dance and Performing Arts (UoA 35)</b>
<b>Title of case study: Case Study 2: The Conservatoire Collection: A Software Library of Digitized Historical Instruments</b>
<p><b>1. Summary of the impact</b> (indicative maximum 100 words)</p> <p><i>The Conservatoire Collection</i> is a commercially distributed software library of ten fully workable sampler instruments for digital audio workstations (DAWs), based on instruments from the Conservatoire's Historical Instrument Collection. The software library was developed and implemented through collaborative research between specialists in historical organology, historical performance practice and music technology, in further collaboration with the commercial partner <a href="#">Soniccouture</a>. This package has been successfully adopted by composers, producers and musical artists across a wide spectrum of the music industry as a highly innovative means of incorporating a range of historical musical instrumental sounds within a digital environment, to the highest professional standards.</p>
<p><b>2. Underpinning research</b> (indicative maximum 500 words)</p> <p>In 2007 Birmingham Conservatoire (PI: George Caird; Researcher: <b>Martin Perkins</b>) secured an AHRC grant of £39K to develop (2007–8) its <a href="#">Historical Instrument Collection</a>, an online cataloguing project and database that brings together measurements, photos, recordings and illustrative performances that utilise the unique collection of <a href="#">historical instruments</a> (woodwind, brasswind, stringed, keyboard and percussion from the 17th to 20th centuries), curated by Birmingham Conservatoire. This open-access resource, in addition to making available the results of the organological research for the catalogue itself, presents an extensive collection of <a href="#">audio-visual materials</a>, including an evolving series of <a href="#">podcasts</a> on iTunesU with transcripts, in collaboration with performance specialists. Podcast 1 comprises an illustrated discussion between Margaret Faultless, the Conservatoire's Baroque Violin Consultant and Co-Leader of the Orchestra of the Age of Enlightenment, and <b>Perkins</b>, on an important collection of 'transitional' bows in the Collection, and their historical and practical significance.</p> <p>In 2009 a Higher Education Innovation Fund (HEIF 4) grant of £35K was secured to advance the practical impact of the research by taking a number of instruments in the Collection to produce workable, high-quality sampler instruments (PI: <b>Simon Hall</b>; Researcher: <b>Martin Perkins</b>; Research Assistant: Joshua Sadler). A logical progression from the cataloguing project, this had as objectives: (i) to facilitate direct user musical interactivity with the historical instruments of the Collection; (ii) to create a library to allow these historical instruments to be accessed by the historical instrument community independent of the originals; (iii) to facilitate implementation of these instruments by composers into DAW-based compositions, with a particular emphasis on media (e.g. film and television) composition and commercial music production; (iv) to license the sampler library in order to take it to market as a commercial product.</p> <p>Ten instruments were selected to be taken forward: French Harpsichord, Flemish Harpsichord, Theorbo, English Theorbo, Baroque Guitar, Psaltery, Baroque Timpani, Renaissance Side Drums, Nakers and Hurdy Gurdy. These ten instruments were then meticulously recorded, sampled in Birmingham Conservatoire's studios at 96kHz/24bit. Performances were executed by historically informed expert performers on each instrument. The recording process itself involved collaborative research between performers and sound engineer (<b>Hall</b>), encompassing (i) analysis of articulation methods, dynamics, pitch regions; (ii) design and development of new technical solutions for the appropriate capture of individual audio characteristics. The individual samples were then edited and implemented into the Kontakt Sampler environment using full round robin sample allocation together with (where appropriate) key off samples, switchable key sets, full tuning control and user selectable scales, selectable articulations, fret hand position control, and multiple additional user features. Recording the keyboard instruments in equal temperament ensured that <i>The</i></p>

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*Conservatoire Collection* would be as flexible as possible to the end user, who could use Kontakt Sampler's built-in temperament scripts to use the samples with historical and other non-equally tempered tunings. (By contrast, some recent harpsichord sample libraries (e.g. Wavesfactory, Sonic State and Edition Beurmann [www.realsamples.net/]) do not have such capability built in.) Commercial licensing and distribution of the final package were negotiated with Soniccouture in 2011. Full details, specification and demos are available at Soniccouture's [Conservatoire Collection](#) website.

### 3. References to the research (indicative maximum of six references)

1. *The Conservatoire Collection: A Software Library of Digitized Historical Instruments* (Soniccouture, 2012): [web link](#) including technical information, demonstration downloads and musical realisations.
2. Birmingham Conservatoire: [Historical Instrument Collection](#).
3. Martin Perkins and Simon Hall, 'Digitized musical instrument sample libraries – a valid archival resource?', conference paper, *Association of International Sound Archivists and Association of Moving Image Archivists, 2010 Conference*, 2–6 November 2010, Philadelphia.
4. Martin Perkins, 'Digitized museum instruments – a valid curatorial tool': conference paper, *Comité International des Musées et Collections d'Instruments de Musique (International Committee of Musical Instrument Museums and Collections)*, 29 August–3 September 2011, Paris/Brussels/Tervuren/Antwerp (on 29 August). Programme at: <http://www.africamuseum.be/museum/research/conferences/docs/programcimcim2011>

#### Key Grants:

- i. 2007–8: Arts & Humanities Research Council (HE Museums, Galleries and Collections Scheme)  
PI: George Caird  
Researcher: Martin Perkins  
Award: £39,060
- ii. 2009–10: Higher Education Innovation Fund (HEIF 4)  
PI: Simon Hall  
Researcher: Martin Perkins  
Research Assistant: Joshua Sadler  
Award: £35,000

### 4. Details of the impact (indicative maximum 750 words)

The initial impetus for the project, and a requirement governed by the funding criteria of HEIF, was to utilize an existing knowledge-base by interacting with the wider world to result in economic and social benefit to the UK. Identifying the Conservatoire Historical Instrument Collection and Music Technology Department as such knowledge-bases and assets had three major advantages: (i) following on from the AHRC cataloguing project, the Collection was still relatively unknown, and it was considered to be of great benefit to the Collection and to the organology community to use it as the focus of the HEIF project; (ii) during the initial research phase of the HEIF application, a significant need was identified for a collection of sampled historical musical instruments. Until recently, musical instrument sample libraries were restricted to modern classical instruments (e.g. [Vienna Symphonic Library](#), established 2005,). The growth of the market has been primarily led by end-users in the music production, home music-making and media industries demanding higher-quality and more realistic samples of acoustic musical instruments. Demand from this sector has also led to less usual instruments being sampled and produced for commercial markets (e.g. Soniccouture's [Rare and Experimental collections](#), including libraries of Glass Harmonica, Extended Piano and Extended Guitar; (iii) sampled historical instruments occupy a different position from that of modern classical samples and less usual samples, in that they appeal not only

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to those wanting to explore music using 'new' sounds, but also to those engaged in the study of historical instruments, period instrument performance and organology. During the initial phase of the HEIF project, extensive research was undertaken into the potential users of a commercial sample library of this kind. Questionnaires answered by UK-based composers and music technologists indicated that 50% used sample libraries in their work, and 81% were interested in sample libraries containing baroque and renaissance instruments. Among the first sample libraries dedicated to historical instruments were those produced by [Organ Art](#), a German company that samples historic organs in continental Europe.

In recent years a number of sample libraries dedicated to historical keyboard instruments have been produced, giving a greater choice to the market. However, *The Conservatoire Collection* remains the only product to contain samples of other historical instruments: Theorbo, English Theorbo, Baroque Guitar, Psaltery, Renaissance Side Drums, Nakers and Hurdy Gurdy. The sample-rate used in the recordings – 96kHz/24bit, compared to standard CD 44.1kHz/16bit – represents a significant improvement over many of the competing sample libraries (e.g. [Spitfire Audio](#), or [Precision Sound](#)). A noteworthy feature of *The Conservatoire Collection* is its use of multiple 'round robin'. During the recording process, multiple recordings are made of the same note using the same parameters (velocity, timbre, etc.), which are then selected at random by the sample player so that the playback does not sound computer-generated.

Since commercial release, *The Conservatoire Collection* has gained significant traction within the music industry, achieving a direct artistic impact, notably with producers of commercial and media-driven music. It is recognized as the best example of these particular instruments available at present. The library, now in general use with many music producers, has been extremely favourably reviewed (4.5/5) in trade journal *Sound on Sound* (December 2011), the writer (himself a composer) stating that the 17th- and 18th-century harpsichords are 'both beautifully deeply sampled and sounding handsome, well-balanced and tonally satisfying. It would be worth buying the collection for these fine instruments alone ... I also loved the exquisitely pure, delicate plucked twang of the Psaltery, an old English zither played with quills.' A high-profile Australian film score composer, whose credits include *Strictly Ballroom* (1992), *Sliding Doors* (1998), *Elizabeth* (1998), *Peaches* (2004), *Australia* (2008), and *Sanctum* (2011), has stated (21 November 2011): 'I like the fact that Soniccouture products provide alternative, off beat, non-standard instruments and brilliant reconstructions of classic rare instruments, like ... the Conservatoire library, which is worth having just for the stunning Harpsichords alone, as well as the Baroque Guitar and the Hurdy Gurdy, an instrument I have wanted to have on tap in a sample library, but couldn't find one until now.' A music producer whose credits include Madonna, Björk, Britney Spears and Imogen Heap featured the French Harpsichord library from the Collection on the track 'Apple Kisses' from Alison Moyet's album *The Minutes* (2013), and has commented (17 May 2013): 'I studied the harpsichord before I became a pop producer. I've purchased other harpsichord libraries ... [but] The thing is, I really respect James and Dan's work [at Soniccouture]. So I knew this would be a great library.... It's really good. I have [other] sample sets ... The only problem is, they're all presented at their original pitch standard and temperament. This causes a lot of problems.' Again, an American music producer, composer and sound designer at Red Noise, La Grange, Illinois has used the Conservatoire Collection in his music for large-scale outdoor spectacles. He has commented: 'I just wanted to write to let you know that the Conservatoire Collection has brought significant benefit for me in my work as a music producer/composer and sound designer. My favourite thing about this collection is quite simply the range of instruments, and the fact that the sample banks were obviously put together by people who knew the instruments well, and could anticipate how they would be used in a composition. I also appreciate the fact that the sound quality is perfect for an intimate arrangement, which these instruments lend themselves to. Layering virtual instruments from the Conservatoire Collection with real instruments makes it possible for me to change the

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arrangements and compositions very quickly when the Director decides to change a scene, without having to re-record an entire ensemble. This means we are able to deliver a high-quality theatrical production without becoming trapped into simply repeating the same show every time; we can easily make changes the afternoon before a performance without compromising quality. I've used the Conservatoire Collection quite extensively in large-scale spectacles requiring period music ... Earlier this year [March 2013] I used the Conservatoire Collection alongside traditional Maori instruments for a work commissioned by the Auckland International Festival (which drew about 50,000 people for 3 nights), and the neutral quality of the recordings in the Conservatoire Collection enabled me to mix the results together very easily and convincingly. That project drew record crowds to the Festival, from all demographics. Thanks for delivering such a powerful, versatile, and high quality creation!

A film composer and sound designer working at Kwarszi Music, Copenhagen has emphasized that the Collection has functioned not only directly as a software library, but also as an imaginative source of inspiration: 'The Conservatoire Collection stands out for its range of specific instruments, new available sounds, quality of sample and the usability/implementation in Kontakt. I have used the Conservatoire Collection instruments for expanding the possibilities for soundtracks with time specific references (documentaries and museum installations) and creating new combinations in electronic works and contemporary compositions. Using the sample library as a direct sound source, and as a compositional tool when imaging new scoring possibilities for instrumental compositions.'

Feedback from a Soniccouture user survey of September 2013, reflecting usage and impact over the period from commercial release in 2012, indicates that the Collection has also been used in the gaming industry by the Music Production Manager, Sony Computer Entertainment Europe, for the music of the Sony PlayStation 3 game 'Wonderbook: Book of Potions' (survey user #21).

Revenue directly generated from sales of *The Conservatoire Collection* to April 2013 totalled £42,830.16 with the 5-year projection being in excess of £150,000.

**5. Sources to corroborate the impact** (indicative maximum of 10 references)

1. Review by established composer and writer for industry magazine [Sound on Sound](#) (December 2011): overall appreciation of quality, especially of the harpsichord samples (full text available upon request).
2. Interview with high-profile Australian film score composer, publicly accessible from [Soniccouture website blog](#), 21 November 2011 as part of overall review of Soniccouture products: appreciation of quality and availability of sampled non-standard instruments for composition (full text available upon request).
3. User feedback from established popular music producer, composer and songwriter, 17 May 2013, through email questionnaire: quality of, especially, the sampled harpsichords and tuning flexibility of the product (full text available upon request).
4. Testimonial from American music producer, composer and sound designer at Red Noise, La Grange, Illinois, 17 October 2013, referring to earlier impact (March 2013 and earlier): appreciation of the overall quality, range, musicality and flexibility of the product (full text available upon request).
5. Testimonial from film composer and sound designer working at Kwarszi Music, Copenhagen, 13 October 2013, referring to earlier and ongoing impact: appreciation of the range, quality and creatively inspiring nature of the product (full text available upon request).
6. Miscellaneous feedback from Soniccouture user survey of *The Conservatoire Collection*, September 2013, reflecting usage since 2012 release (Survey Monkey login details for inspection of results from > 90 users available upon request).