Research Interests

Music Information Retrieval, Audio Signal Processing, Machine Learning, Human Computer Interaction, Digital Libraries, Software Frameworks for Audio Processing, Auditory Scene Analysis

Education

- **Ph.D in Computer Science, Princeton University 2002**
  Manipulation, Analysis and Retrieval Systems for Audio Signals
  Advisor: Perry Cook

- **MA in Computer Science, Princeton University 1999**

- **BSE Computer Science, Magna Cum Laude, University of Crete, Greece 1997**

- **Music Education**

  - Music Theory and Composition - Music Department, Princeton University
    (10 courses while doing PhD in Computer Science) (1997-2001)
  - Musicology, saxophone performance, and theory
    Athenaum Conservatory, Athens, Greece (1993-1997)
  - Piano and theory - Heraklion Conservatory, Greece (1985-1995)

Professional Employment History

- **2010-present: Associate Professor of Computer Science, University of Victoria, BC Canada**
  (also cross-listed in Music, and in Electrical and Computer Engineering)

- **2011 (6 months): Visiting Scientist**, Google Research, Mountain View, California
  Collaboratos: Dick Lyon, Douglas Eck, Jay Yagnik, David Ross, Tom Walters

- **2003-2010: Assistant Professor of Computer Science, University of Victoria, BC Canada**
  (also cross-listed in Music, and in Electrical and Computer Engineering)

- **2002-2003: Postdoctoral Fellow, Computer Science, Carnegie Mellon University
  (Computer Music Group, Informedia Group)**
  Collaborators: R.Dannenberg, C.Atkenson, A.Hauptmann, H.Wactlar, and C. Faloutsos

- **1997-2002: Research Assistant, Princeton University**

- **Summer 2000: Moodlogic Inc., San Francisco, CA**
  (Chief designer of patented audio fingerprinting technology)

- **Summer 1999: SRI International, Menlo Park, CA**
  (Summer Internship at the Computer Human Interaction Center (CHIC))

- **1995-1997: Institute for Computer Science (FORTH), Heraklion, Greece**
  Computer Vision and Robotics Group

- **1995-1997: Private saxophone tutor, Heraklion, Greece**

- **1993-1997: First alto saxophone, Heraklion Municipal Band**

- **1995-1997: Institute for Computer Science (FORTH), Heraklion, Greece**
  Information Systems and Software Technology Group

- **Consulting Positions:**

    - Moodlogic Inc. USA 2000-2002
    - AllMusic Inc. Netherlands 2003-2005
    - Memotrax Inc. Canada 2004-2006
    - Teligence Communications Inc. Canada 2005-2007
    - Nuance Inc. USA 2008
    - MedianRain Inc. USA 2009
    - Talk Tech Inc. Canada 2010
    - IVL Audio Inc. Canada 2008 - 2011
    - Optinera Inc. Canada 2011 - 2012
    - Chunghwa Telecommunication Labs Canada 2011-2012
    - Wifarer Inc Canada 2012 - 2014
    - Jasco Applied Sciences Canada 2015
    - SpeakerWrap Inc USA 2015
    - Shneider Electric Canada 2015
    - Limbic Media Inc Canada 2015

Research Themes and Contributions

My research is inherently interdisciplinary and has the common unifying thread of using state-of-the-art signal processing, machine learning and visualization techniques to extract and analyze information from audio signals with specific emphasis on music. By increasing the quantity and quality of what the computer can "listen to" we can develop more effective tools for indexing and manipulating large audio collections as well as improve musician-computer interactions.

Music Information Retrieval

Music Information Retrieval (MIR) is a new emerging area of multimedia research dealing with the analysis and retrieval of music in digital form. It reflects the tremendous recent growth of music-related data digitally available and the consequent need to search within it to retrieve music and musical information efficiently and effectively. The majority of my research has focused on proposing and solving a variety of MIR problems. I was fortunate to be one of the pioneers of this research area and my publications have inspired a large volume of subsequent work and had significant impact (h-index of 29 (24 since 2008) based on Google Scholar, June 2013). MIR topics that I have worked on include: audio segmentation [C79,C125,C127,C128], compressed domain audio feature extraction [C124], peer-to-peer networks for content-based audio retrieval [J20,C105,C112], query-by-humming [J17,C21,C107] , similarity retrieval [J22, C44,BC7,C123], singing voice and gender identification [C91,C102], audio matching and alignment [C109], feature extraction [J9,J11,BC5,J23,C58,C73,C94,C116,C120,C123], polyphonic instrument recognition [C74], instrument classification [J7, C51], multi-tag annotation [C53, 33], rhythm analysis [J18,C90,C115, C23], chord, key, and structure detection [C22, C25], music transcription and audio factorization [C18] .

In my work on musical genre classification [J9,J13,J24,C103,C104,C106,C108,C119,C128] I proposed a combination of feature extractors based on the Short-Time Fourier Transform and Wavelet Analysis that

can be used together with machine learning techniques to automatically detect the musical genre of a music piece in audio format. The journal paper describing this work [J24] received the prestigious 2004 IEEE Signal Processing Society Young Author Award and is highly cited (1600+ citations - Google Scholar (accessed June 2013)). An important aspect of the work was the inclusion of features such as rhythm and pitch information that apply specifically to musical signals in addition to more general audio features. The dataset and obtained classification results are frequently used as a benchmark for automatic musical genre classification.

Visualization and User Interfaces for Audio and Music

Another major research theme has been the design and development of several novel content and context aware visualization tools and user interfaces for browsing and manipulating audio and music collections [J19,C19, C55,C56,C59,C75,C77,C87,C94,C99,C110,C111,C113,C114,C117,C121,C122,C126]. The combination of well designed user interfaces that leverage human capabilities together with automatic content-based analysis can result in powerful semi-automatic tools. In addition I have worked on immersive audio and visual displays [J25,J78,C88,C129]. My group has also explored the use of location in smartphone music interfaces [C48].

Audio Processing Software

Marsyas is a framework for computer audition research that has been available as open source software since 1999. The impact of Marsyas has been steadily increasing especially since 2007 when a more comprehensive website was launched and the core team increased to approximately **4-5 developers**. Since November **2007** when the new website was launched it has received **52483** visits (approximately **41.07 visits/day**) from **136 countries** (from Google Analytics, April 2011). The software framework has approximately **300-400 downloads** per month since **2007** an increase from less than 50 downloads/month in 2003. In the summer of 2009 Marsyas was a finalist (top 10 of 730 nominations) project in the Open Source Software for Academia community choice awards and received over 300 votes of support.

The software provides a variety of common building blocks for audio analysis as well as a development environment that facilitates experimentation and creation of real-time audio analysis systems [BC6,BC7,J26, C54,C64,C65,C85,C93,C95]. Marsyas has been used for a variety of projects in academia and industry several of which are described in `http://marsyas.info/about/projects`. Industrial applications include prototyping the patented audio fingerprinting technology of Moodlogic Inc. which has been used by more than **100,000** users to link mp3 audio files to a large database (**1.5 million songs**) of metadata and a gender identification system for voice messages designed for Teligence Inc. that is processing approximately **25,000 voice recordings per day**.

Academic projects include emotion recognition in music (Greece, Canada), novel interfaces for browsing music (Japan), a dancing music robot (Portugal), and a multi-model search engine for music in YouTube videos (Singapore). A large number of publications have been written about Marsyas (6), using Marsyas (31) and citing Marsyas (12). In addition the software has been the basis of several undergraduate projects and 4 graduate theses. More details can be found at `http://marsyas.info/about/publications`. Algorithms based on Marsyas are regularly submitted to the Music Information Retrieval Evaluation Exchange (`http://www.music-ir.org/mirex/2009/index.php/Main_Page`) where they exhibit state-of-the-art performance while being orders of magnitude faster than other submissions. Marsyas is cross-platform and compiles under Windows (Visual Studio, MinGW and Cygwin), MacOS X, Linux, Solaris and Irix. More information can be found at: `http://marsyas.info`.

Music performance analysis, music robotics, and computer-assisted musical instrument tutoring

Since my appointment at the University of Victoria me and my students have been working on developing

techniques for acquiring and analyzing gestural information from music performances [C28, C42, C29, C46,C69,C71,C84,C92,C96,C97, C99,C101]. Both sensors [C20, C21, C69] and audio analysis [C24], C98,C100] as well as hybrid combinations [C28, J8] have been utilized. Audio recordings only capture the end result of a music performance whereas we are interested in capturing and analyzing the process musicians use to actually create the music on their instruments. We have also explored the use of robotic devices that utilize the extracted information to "musically" participate in performance and improvisation [C36, C68,C81,86]. Using automatic analysis tools it is also possible to assist students with feedback and targeted exercises during musical instrument practice [C63,C70,C76].

Computational Auditory Scene Analysis

Auditory scene analysis refers to the process of identifying, characterizing and potentially separating the individual sound sources in an environment. My group has proposed an approach to predominant melodic source separation in polyphonic audio signals that provides good results while being orders of magnitude more efficient than other source separation algorithms [BC4,J14,C82]. It utilizes a sinusoidal representation front-end followed by a peak grouping stage that is applied across time and frequency. A peak similarity metric incorporating frequency, amplitude and harmonic promimity is used in conjuction with spectral clustering to form the groups [J14,C67]. In the context of this work we also have proposed a novel harmonicity-based similarity between spectral peaks that can be used to efficiently enhance harmonic signals [C67]. The source separation systems has been used for different tasks including: mono-to-stereo upmixing [J78], harmonization [C72], and polyphonic instrument recognition [C74]. We have also proposed a method for the amplitude estimation of coincident partials [J12].

Computational Ethnomusicology

Most of existing work in Music Information Retrieval has concentrated on either western popular music or classical music. Computational ethnomusicology [J16] can be defined as the use of computatational tools such as MIR algorithms and systems for the study of specific music cultures around the world. Our work in this area is characterized by designing systems that are specific to a particular music culture in consultation with experts such as ethnomusicologists. Examples of music cultures we have explored include: North Indian Sitar performance [C76], Afro-Cuban percussion [C61,C62], and various types of religious text recitation and chants [C35, C49,C10, C60, C66]. Our goal is to build content and context-aware user interfaces and tools that can assist musicologists exploring specific music cultures. During the design and development of these tools we closely collaborate with musicologists who provide feedback and domain-specific knowledge.

Large-scale Bioacoustics

Bioacoustics is a cross-disciplinary science that investigates the sound production and reception in animals. My group has been active developing tools for analysis, retrieval and visualization of large archives of animal sounds with specific emphasis on the vocalizations of Orcas. In collaboration with Orcalab, a research station of northern Vancouver Island in British Columbia, Canada, we are digitizing over 20000 hours of audio recordings from analog media to a digital database and developing semi-automatic and automatic analysis tools for more effectively accessing these large amounts of data [C37, C38, C39, C15, C45,C66,C80]. In the summer of 2009 in collaboration with the Neptune networked underwater observatory we were awarded a CANARIE grant to extend this work to the acoustic data captured by the Neptune instruments and with input from scientists develop tools for research in marine mammal communications.

Audio Fingerprinting and Cover Song Detection

Designed and developed content-based audio fingerprinting technology for Moodlogic Inc [P7]. This patented software was used by more than 100.000 users to link mpeg audio compressed files to a large

database (1.5 million songs) of metadata that Moodlogic provides to its users. Some characteristics of the fingerprinting algorithm are: extraction (2 seconds), matching speed (200 milliseconds for 1.5 million songs), size (300 bytes), accuracy (100% - 13500 queries of 1.5 million songs).

During a 6 month study leave, as a visiting scientist at Google Research, worked and made contributions to a large scale cover song detection system that is applied to every video uploaded on YouTube (72 hours of video uploaded every minute). The system helps song writers and music publishers, and YouTube to increase their advertisement revenue. During the same period made fundamental contributions and is a named inventor on 6 pending US patents related to audio fingerprinting technology. This technology is included in all Android Devices running the "Jelly Bean" version of the operating system starting in the Fall of 2012 (33% of all Android Devices (June 2013)).

Other topics

In addition to these major themes, my group has also worked on: motion estimation [C130], voice transformation [J15], assistive technologies [C59], teaching programming through audio manipulations [C89], control of spatialized audio [C47], tangible interfaces for sonification [C50], adapting music to game play [C52], swarm painting [C40,C41], teaching interfaces for computer vision [C34, and development of new controllers for music expression [C57]. The control of physical modeling synthesis algorithms has also been explored using hybrid acoustic instruments [C27] and machine learning [C43].

As a consultant for IVL Audio Inc, I was instrumental in the design of the three Morpheus guitar effects pedals that perform real-time, low latency, polyphonic pitch shifting (`http://morpheusefxsite.abff.stackablehost.com/droptune.php#`). These pedals have been endorsed by several well known electric guitarists and the Morpheus Bomber pedal was selected by Craig Anderson (a well known musical journalist) as the best new product of the NAMM (National Association of Music Merchants) show when it was introduced in 2011.

Awards and Honours

- **Craigdaroch Research Award in Artistic Expression, University of Victoria, 2012**
- **Canada Tier II Research Chair in Computer Audio and Music Analysis, 2010**
- **IEEE Signal Processing Society Young Author Best Paper Award 2004**
  for "Musical Genre Classification of Audio Signals", IEEE Transactions on Speech and Audio Processing, July 2002.
- **Ericsson Award of Excellence for Senior Thesis**
  "The use of GSM speech compression for pitch modification in a greek text-to-speech system".
- Annual greek national foundation scholarships 1994-1996
- First prize 1996 Programming Contest, University of Crete, Greece

Publications

Impact metrics

- h-index (number of publications that have more than h citations) = 34 (26 since 2011)
- i10-index (number of publications that have 10 or more citations) = 70 (49 since 2011)
- Citations = 7016 (3179 since 2011)

All metrics and citations are based on Google Scholar (`scholar.google.com`) accessed on the CV revision date provided on the first page. Google scholar profile: `https://scholar.google.ca/citations?user=yPgxxpwAAAAJ&hl=en`

Patents

P1. *Magnitude ratio descriptors for pitch resistant audio matching* Matthew Sharifi, Dominik Roblek, George Tzanetakis US Patent Number: 9202472, December 1, 2015

P2. *Ensemble interest point detection for audio matching* Matthew Sharifi, Gheorghe Postelnicu, George Tzaentakis, Dominik Roblek US Patent Number: 13274725, August 4, 2015

P3. *Frequency ratio fingerprint characterization for audio matching* Matthew Sharifi, George Tzanetakis, A. Chen, D. Roblek US Patent Number: 8886543, Nov 11, 2014

P4. *Intelligent interest point pruning for audio matching* Matthew Sharifi, Gheorge Postelnicu, George Tzanetakis, Dominik Roblek US Patent Number: 8831763, Sept 9, 2014

P5. *Noise based interest point density pruning* George Tzanetakis, Roblek, Dominik, Matthew Sharifi US Patent Number: 8805560, Aug 12, 2014

P6. *Transformation invariant media matching* Matthew Sharifi, Sergey Ioffe, Jay Yagnik, Gherghe Postelnicu, Dominik Roblek, George Tzanetakis US Patent Number: 8738633 B1, May 27, 2014

P7. *Method and System for Analyzing Digital Audio Files* Rehan M. Khan, G. Tzanetakis. US Patent Number: 7277766 B1, Oct. 2, 2007 (**72 citations**)

Books

B1. *Music Data Mining* T. Li, M. Ogihara, G. Tzanetakis (editors) CRC Press, ISBN 978-1-4398-3552-4, 2011

Book Chapters (peer-reviewed)

BC1. *Natural Human-Computer Interaction with Musical Instruments* in Digital Tools for Computer Music Production, D. Politis, M. Tsalighopoulos, I. Iglezakis (editors), pp. 116-136, IGI Global, ISBN10: 1522502645, 2016

BC2. *Music Mining* G.Tzanetakis in Academic Press Library in Signal Processing, S. Theodoridis, R. Chellapa (editors), pp. 1453-1490, Academic Press, 978-0-12-396502-8, 2013

BC3. *Audio Feature Extraction* G. Tzanetakis in Music Data Mining. T. Li, M. Ogihara and G. Tzanetakis (editors), pp. 43-69, CRC Press, ISBN 978-1-4398-3552-4, 2011

BC4. *Modeling Grouping Cues for Auditory Scene Analysis using Spectral Clustering* L.G. Martins, M. Lagrange, G. Tzanetakis. Machine Audition: Principles, Algorithms and Systems. Wen Wu (editor), pp. 22-60, ISBN10: 1615209190, IGI Global, 2010

BC5. *Music Information Retrieval in Polyphonic Music* K. Lemstrom, G. Tzanetakis. Encyclopedia of Library and Information Sciences. M. Bates; M.N. Maack, M. Drake (eds), Taylor and Francis, 2008

BC6. *Marsyas-0.2: a case study in implementing music information retrieval systems* G. Tzanetakis Intelligent Music Information Systems: Tools and Methodologies, (eds) Shen, Shepherd, Cui, Liu, Information Science Reference, ISBN 978-1-59904-663-1, pp. 31-49, 2007

BC7. *Where is the music in music information retrieval ?* G. Tzanetakis. MMIR Multimedia Information Retrieval: Metologie ed Esperienze Internazionali di Content-based Retreival per L' informazione e la Documentazione. Editors: R. Raieli, et P. Innocenti. AIDA, Roma, pp. 327-346 ISBN 88-901144-9-5, 2004

Journal Articles (peer-reviewed) [1]

J1. *Personalizing self-organizing music spaces with anchors: design and evaluation*, **L. Collares**, T. Tavares, A. Gooch, G. Tzanetakis, Multimedia Tools and Applications, Springer, (accepted for publication), 2017

J2. *Models for Music Analysis from a Markov Logic Networks Perspective*, Helene Papadopoulos, G. Tzanetakis IEEE/ACM Transactions on Audio, Speech and Language Processing, 25(1), pp. 19-34, 2017

J3. *Document segmentation and classification into musical scores and text*, **F.Pedersoli**, G. Tzanetakis, International Journal of Document Analysis and Recognition (IJDAR), DOI: 10.1007/s10032-016-0271-5, 19(4), pp. 1-16, 2016

J4. *Streamlined Tempo Estimation based on Autocorrelation and Cross-correlation with Pulses*, G. Percival, G. Tzanetakis, IEEE Transactions on Audio, Speech, and Language Processing (TASLP), 22(12), pp. 1765-1776 2014

J5. *Sonophenology: A Multimodal Tangible Interface for the Sonification of Phenological Data at Multiple Time-Scales*, **S. Ness**, **P. Reimer**, **J. Love**, W.A Schloss, G. Tzanetakis, Journal of Multimodal User Interfaces, 5(3), pp. 123-129, Spring Verlag, 2012.

J6. *The E-Drum: A case study for machine learning in new musical controllers*, A. Tindale and G. Tzanetakis, Journal of Interdisciplinary Music Studies (JIMS), 6(2), pp. 115-136, 2012.

J7. *Musical Instrument Classification using Individual Partials* J. Barbedo, G. Tzanetakis, IEEE Transactions on Audio, Speech and Langunage Processing (TASLP), 19(1), pp. 111-122, 2011

J8. *Training Surrogate Sensors in Musical Gesture Acquisition Systems*, A. Tindale, A. Kapur, G. Tzanetakis, IEEE Transactions on Multimedia (TMM), 13(1), pp. 50-59, 2011

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[1]Co-authors in bold indicate supervised students

J9. *Beyond Timbral Statistics: Improving Music Classification using Percussive Patterns and Bass Lines* E. Tsunoo, G. Tzanetakis, N. Ono, S. Sagayama, IEEE Transactions on Audio, Speech and Language Processing (TASLP), 19(4), pp. 1003-1014, 2011

J10. *Computer-assisted cantillation and chant research using content-aware web visualization tools* **S. Ness**, G. Tzanetakis, D.P. Biro, Multimedia Tools and Applications, Spring Verlag, 48(1), pp. 207-224, 2010

J11. *Stereo Panning Information for Music Information Retrieval Tasks* G. Tzanetakis, J.G. Martins, K. McNally, R. Jones, Journal of the Audio Engineering Society (JAES), 58(5) pg. 409-417, 2010

J12. *Correlation-Based Amplitude Estimation of Coincident Partials in Monaural Musical Signals* J. Barbedo, G. Tzanetakis, EURASIP Journal on Audio, Speech and Music Processing (ASMP), Volume 2010(2010), Article ID 523791, 15 pages, doi: 10.1155/2010/523791, 2010

J13. *Audio-based classification of music signals* G. Tzanetakis, E. Tsunoo, (in Japanese) Information Processing Society of Japan (IPSJ) Magazine, 50(8), 2009

J14. *Normalized Cuts for Predominant Melodic Source Separation.* M. Lagrange, L.G. Martins, **J. Murdoch**, G. Tzanetakis. IEEE Transactions on Audio, Speech and Language Processing (TASLP) , 16(2), pp. 278-290, February 2008.

J15. *Transforming Perceived Vocal Effort and Breathiness Using Adaptive Pre-emphasis Linear Prediction* **K. Nordstrom**, G.Tzanetakis, P.Driessen. IEEE Transactions on Audio, Speech and Language Processing (TASLP), , 16(6), pp. 1087-1096, August 2008.

J16. *Computational Ethnomusicology* G. Tzanetakis, A. Kapur, W.A. Schloss, M. Wright. Journal of Interdisciplinary Music Studies, 1(2), pp. 1-24, Fall 2007 **(86 citations)**

J17. *A Comparative Evaluation of Search Technologies for Query-by-Humming Using the MUSART Testbed.* R. Dannenberg, W. Birmingham, B. Pardo, N. Hu, C. Meek, and G. Tzanetakis. Journal of the American Society for Information Science and Technology, 58(3), pp. 687-701, February 2007 **(99 citations)**

J18. *An Experimental Comparison of Audio Tempo Induction Algorithms.* F. Gouyon, A. Klapuri, S. Dixon, M. Alonso, G. Tzanetakis, C. Uhle, and P. Cano. IEEE Transactions on Audio, Speech and Language Processing, Vol. 14(5), pp. 1832-1844, 2006 **(190 citations)**

J19. *Visualization in Audio-Based Music Information Retrieval.* M. Cooper, J. Foote, E. Pampalk, G. Tzanetakis. pp. 42-62, Computer Music Journal, 30(2), 2006.

J20. *A scalable peer-to-peer system for music content and information retrieval.* G. Tzanetakis, J. Gao, P. Steenkiste. Computer Music Journal, 28(2), pp. 24-33, 2004.

J21. *The MUSART testbed for query-by-humming evaluation.* R. Dannenberg, W. Birmingham, B. Pardo, N. Hu, C. Meek, and G. Tzanetakis. Computer Music Journal, 28(2), pp. 34-48, 2004 **(87 citations)**

J22. *Music Analysis and Retrieval Systems.* G. Tzanetakis, P. Cook. Journal of the American Society for Information Science and Technology. 55(12), pp. 1077-1083, 2004.

J23. *Pitch Histograms in Audio and Symbolic Music Information Retrieval.* G. Tzanetakis, A. Ermolinskyi, P. Cook. Journal of New Music Research, 32(2), pp. 143-152, 2003 **(160 citations)**

J24. *Musical Genre Classification of Audio Signals.* G. Tzanetakis, P. Cook. IEEE Transactions on Speech and Audio Processing, 10(5), pp. 293-302, July 2002 **(2170 citations)** .
(Winner of the 2004 IEEE Signal Processing Society Young Author Best Paper Award)

J25. *Early Experiences and Challenges in Building and using a Scalable Display Wall System* K. Li et al., IEEE Computer Graphics and Applications, Special Issue: "Off the Desktop: Large-Format Displays", 20(4), pp. 29-37, 2000 **(278 citations)**

J26. *MARSYAS: A Framework for Audio Analysis* **(384 citations)** G. Tzanetakis, P. Cook. Organized Sound 4(3), pp. 169-175, 2000.

Conference Papers (peer-reviewed)

C1. *VRMin: Using Mixed Reality to Augment the Theremin for Musical Tutoring* **D. Johnson**, G. Tzanetakis, Proc. New Interfaces for Musical Expression (NIME), 2017

C2. *Voice Coil Actuators for Percussion Robotics* **R. van Rooyen**, A. Schloss, and G. Tzanetakis, Proc. New Interfaces for Musical Expression (NIME), 2017

C3. *Detecting Pianist Hand Posture Mistakes for Virtual Piano Tutoring* **D. Johnson**, **I. Dufour**, D. Damian, G. Tzanetakis, Proc. Int. Computer Music Conf., 2016

C4. *Melodic Stability and Memory Analysis in Semi-Oral Chant Traditions: A Computational Study of Quran Recitation and Torah Trope* D. Biro, P. van Kranenburg, and G. Tzanetakis, Proc. Analytical Approaches to World Music, 2016

C5. *Guitar Model Recognition from Single Instrument Audio Recordings* **D. Johnson**, G. Tzanetakis, Proc. IEEE Pacific Rim Conf. (PACRIM), 2015

C6. *A Comparison of Conventional and Meta-Modal Based Global Optimization Methods* **A. E. Saad**, **H. Lohrasbipeydeh**, Z. Dong, G. Tzanetakis, A. Gulliver, Proc. IEEE Pacific Rim Conf (PACRIM), 2015

C7. *Pragmatic Drum Motion Capture System* **R.V. Rooyen**, G.Tzanetakis, Proc. New Interfaces for Musical Expression (NIME), pp. 339-342, 2015

C8. *Adaptive Music Technology: History and Future Perspectives*, **K. Graham-Knight**, G.Tzanetakis, Proc. Int. Computer Music Conference (ICMC), pp. 32:1-4, 2015

C9. *Adaptive Music Technology Using the Kinect*, **K. Graham-Knight**, G. Tzanetakis, (best student paper award) Proc. Pervasive Technologies Related to Assistive Environments (PETRA), 2015

C10. *Human and Machine Annotation in the Orchive, a large bioacoustic archive*, **S. Ness**, G. Tzanetakis, Proc. IEEE Global Conference on Signal and Information Processing (GLOBALSIP), 2014

C11. *Declarative Composition and Reactive Control in Marsyas*, **J. Leben**, G. Tzanetakis, Proc. Int. Computer Music Conf. (ICMC), pp. 325-331, 2014

C12. *Estimation of the direction of strokes and arpeggios*, I. Barbancho, G. Tzanetakis, L. J. Tardon, P. F. Driessen and A. M. Barbanch, Proc. Int. Conf. of the Society for Music Information Retrieval (ISMIR), pp. 41-46, 2014

C13. *Physical Modelling and Supervised Training of a Virtual String Quartet*, G. Percival, N. Bailey, G. Tzanetakis, Proc. ACM Multimedia, pp. 103-112

C14. *Empirical Analysis of Track Selection and Ordering in Electronic Dance Music using Audio Feature Extraction*, T. Kell, G. Tzanetakis, Proc. Int. Conf. of the Society for Music Information Retrieval (ISMIR), pp. 505-510, 2013

C15. *The Orchive: Data Mining a Massive Bioacoustic Archive*, **S. Ness**, G. Tzanetakis, Proc. Int. Conf. on Machine Learning (ICML) Workshop on Machine Learning for Bioacoustics, 2013

C16. *The Wiikembeperformer designed lamellophone hyperinstrument for idiomatic musical-DSP interaction*, **S. Trail**. G. Tzanetakis, Proc. IEEE Pacific Rim Conf (PACRIM), pp. 410-414, 2013

C17. *STARI: A self tuning auto-monochord robotic instrument*, **S. Trail**, G. Tzanetakis, L. Jenkins, M. Cheng, D. MacConnell, P. Driessen, Proc. IEEE Pacific Rim Conf (PACRIM), pp. 405-409, 2013

C18. *Factors in Factorization: Does better audio source separation imply better polyphonic music transcription ?*, **T. F. Tavares**, P. Driessen, G. Tzanetakis, IEEE Int. Conf. on Multimedia Signal Processing (MMSP), pp. 424-428, 2013

C19. *Sound Anchoring: Content-based Exploration of Music Collections with Anchored Self-Organized Maps* **L. Collares**, **T. F. Tavares**, **J. Feliciano**, **S. Gao**, G. Tzanetakis, A. Gooch, Proc. Sound and Music Computing (SMC), pp. 768-775, 2013

C20. *Reconfigurable Autonomous Novel Guitar Effect System (RANGE)* **D. McConnel**, **S. Trail**, P. Driessen, G. Tzanetakis, Proc. Sound and Music Computing (SMC), pp.674-677, 2013

C21. *An Easily Removable, wireless Optical Sensing System (EROSS) for the Trumpet* **L. Jenkins**, **S. Trail**, G. Tzanetakis, P. Driessen, and W. Page, Proc. New Interfaces for Musical Expression (NIME), pp. 352-357, 2013

C22. *Exploiting structural relationships in audio music signals using Markov Logic Networks* H. Papadopoulos, G. Tzanetakis, Proc. Int. Conf. on Audio, Speech and Signal Processing (ICASSP), pp. 1-5, 2013

C23. *An effective simple tempo estimatio method based on self-similarity and regularity*, G. Tzanetakis, G. Percival, Proc.Int. Conf. on Audio, Speech and Signal Processing (ICASSP), pp. 241-245, 2013

C24. *Audio-visual vibraphone transcription in real time* T. F. Tavares, **G. Odowichuck**, **S. Zehtabi**, G. Tzanetakis, Proc. IEEE Int. Conf. on Multimedia Signal Processing (MMSP), pp. 215-220, 2012

C25. *Modeling Chord and Key Structure with Markov Logic*, H. Papadopoulos, G. Tzanetakis, Proc. Int. Conf. of the Society for Music Information Retrieval (ISMIR), pp. 121-126, 2012

C26. *Browsing Music and Sound using Gestures in a Self-Organized 3D Space*, **G. Odowichuck**, G. Tzanetakis, Proc. Int. Computer Music Conf. (ICMC), pp. 543-546

C27. *Physical Modeling and Hybrid Synthesis for the Gyil African Xylophone*, D. Godlovich, T. F. Tavares, S. Trail, G. Tzanetakis, Proc. Sound and Music Computing (SMC), pp. 41-48, 2012

C28. *Direct and surrogate sensing for the Gyil african xylophone*, **S. Trail**, T.F. Tavares, D. Godlovich, G. Tzanetakis, Proc. New Interfaces for Musical Expression (NIME), 2012

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Other publications (abstract only or non-referred)

1. *Analysis of Drum Machine Kick and Snare Sounds* **J. Shier**, K. McNally and G. Tzanetakis, Proc. Audio Engineering Society (AES) Convention, 2017

2. *A digital library to advance interdisciplinary research in singing*, A. Cohen, C. Vincent, D. Moses, I. Fujinaga, N. Lefford, T. Leonard, G. Tzanetakis, (Int. Conf. on Acoustics), 2013

3. *The need for music information retrieval with user-centered and multimodal strategies*, C. Liem, M. Muller, D. Eck, G. Tzanetakis, Proc. ACM Workshop on Music Information Retrieval with user centered and multimodal strategies (MIRUM), 2011

4. *New tools for use in the musicology of record production* K.McNally, G. Tzanetakis, S. Ness. Art of Record Production, 2009

5. *Review: Signal Processing Method for Music Transcription, A. Klapuri, and M. Davy (Eds)* G. Tzanetakis Computer Music Journal, 32(4), 2008

6. *Digital Audio Collages: Sound FX on Creativity and Perceptually-Informed Software Development* **J. Murdoch** L. Jackson, Y.Coady, G. Tzanetakis. Proc. Western Canadian Conference on Computing Education, 2008.

7. *New Tools for Visualizing Musical Timing* M.Wright, W.A. Schloss, G. Tzanetakis, Proc. 2008 Society of Ethnomusicology Annual Conference, 2008.

8. *Decoding the Song: Histogram-Based Paradigmatic and Syntagmatic Analysis of Melodic Formulae in Hungarian Laments, Torah Trope, Tenth Century Plainchant and Koran Recitation* D.P. Biro, **S. Ness**, W.A. Schloss, G. Tzanetakis, M. Wright. Expressivity in Music and Speech Workshop, IRCAM, Paris, France, 2008.

9. *Music Information Retrieval based on Signal Processing*, (editorial) I. Fujinaga, M. Goto, G. Tzanetakis, EURASIP Journal on Advances in Signal Processing, 2007

10. *Audio Forensics: Solving a Crime using Digital (Audio) Signal Processing* **J.Murdoch**, Y. Coady, G. Tzanetakis. IEEE Real World Engineering Projects Award, 2007.

11. *Flexible event scheduling for dataflow audio processing* **N. Burroughs**, G. Tzanetakis, Object Oriented Programming Systems, Languages and Applications (OOPSLA), Portland, Oregon, USA, 2006

12. *Studio Report: University of Victoria Music Intelligence and Sound Technology Interdisciplinary Centre (MISTIC)* P. Driessen, W.A. Schloss, G.Tzanetakis, K. McNally, **A.Kapur**, Int. Computer Music Conf. (ICMC), 2005

13. *Manipulation, analysis, and retrieval systems for audio signals* G. Tzanetakis, Princeton Computer Science Technical Report TR-61-02, June 2002, (Ph.D thesis) **(169 citations)**

14. *The use of GSM speech compression for pitch modification in a Greek text-to-speech system* Senior thesis, University of Crete, Greece (Erricson Award of Excellence), 1996

Student Supervision

- **Past PostDocs**

- **Dan Godlovich** (Phd, University of Victoria, Canada), 2013 (6 months). Audio Engineer, Harman Kardon
- **Graham Percival** (Phd, University of Glasgow, UK), 2013 (6 months). Software Engineer, Tarsnap, Vancouver, Canada
- **Helene Papadopoulos** (PhD IRCAM, Paris, France), 2011-2012. CNRS Researcher, France
- **Farook Sattar** (PhD Lund University, Sweden) 2010-2011. Research faculty, Electrical and Computer Engineering, University of Waterloo, Canada.
- **Alexander Lerch** (PhD Technische Universitat Berlin) 2010. Assistant Professor, School of Music, George Tech, US also co-owner and managing director of zplane.development a privately held software company.
- **Jayme Barbedo** (PhD State University of Campinas (Unicamp), Campinas, Brazil), 2008-2009. Currently Visiting Researcher at the Department of Communications, School of Computer and Electrical Engineering, State University of Campinas
- **Mathieu Lagrange** (PhD University of Bordeux, France), 2006-2007. CNRS Researcher, France
- **Mathew Wright** (PhD CCRMA, Stanford, USA), 2007-2008. Technical Director, Center for Computer Research in Music and Acoustics (CCRMA), Stanford Univeristy, USA

- **Current PhD Students**
  - **Shawn Trail, Interdisciplinary** (co-supervsised Dr. A.Schloss)
  - **Jacob Leben**, Computer Science
  - **Robert van Rooyen**, Computer Science
  - **David Johnson**, Computer Science
  - **Fabrizio Pedersoli**, Computer Science
  - **Isabelle Dufour**, Computer Science co-supervised Dr. Coady
  - **Tom Arjanikov**, Computer Science

- **Past PhD Students**
  - **Steven Ness - Computer Science (2010-2013)**
    Thesis: The Orchive : A system for semi-automatic annotation and analysis of a large collection of bioacoustic recordings.
    Software Engineer - Salesforace, Inc, USA
  - **Adam Tindale - Interdisciplinary (2009)**
    Thesis: Advancing the Art of Electronic Percussion
    Associate Professor
    Ontario College of Art and Design University (OCAD-U)
  - **Ajay Kapur - Interdisciplinary (2005-2007)**
    Thesis: Digitizing North Indian Music: Preservation and Extension using Multi-Modal Sensor Systems, Machine Learning and Robotics.
    Director, Multi-Focus Music Technology Program
    Associate Dean for Research and Development
    California Institute of the Arts (CalArts)

- **Current MSc Students**

  - **Feng Liu, Computer Science**
  - **Kimberlee Graham-Knight, Computer Science**

- **Past MSc Students (graduated)**

  - **Steven Bjornson, Interdiscipilnary Computer Science and Visual Arts, 2015-2016 co-supervised with Dr. Walde**
    Interactivity by Design: Interactive Art Systems Through Network Programming
    Engineer, Libmic Media Inc

  - **Isabelle Durfour, Computer Science, 2014-2015, co-supervised with Dr. Coady**
    Improving Music Mood Annotation Using Polygonal Circular Regression
    PhD student, University of Victoria

  - **Leonardo Jenkins, Electrical and Computer Engineering (2011-2013), co-supervised with Dr. Driessen**
    An Easily-Removable, Wireless Optical Sensing System (EROSS) for the Piston Valve Acoustic Trumpet

  - **Sonmaz Zehtabi, Computer Science (2011-2013)**
    Vibraphone Transcription from Noisy Audio Using Factorization Methods
    Software Developer, Abe Books

  - **Justin Love, Interdisciplinary (2010-2012) (co-supervised with Dr. Wyvill)**,
    Aesthetic Agents: Experiments in Swarm Painting
    Director Limbic Media

  - **Gabrielle Odowichuck, Electrical and Computer Engineering (2012), co-supervised with Dr. Driessen**
    Free-space Gesture Mappings for Music and Sound
    Research Engineer, Limbic Media

  - **Yan Li, Electrical and Computer Engineering (2010) (co-supervised Dr. Driessen)**
    Spatial Sound Rendering Using Measured Room Impulse Responses
    DSP engineer at IVL Audio, Inc.

  - **Bidong Chen, Computer Science (2005-2010) (co-supervised with Dr. Wu)**
    Audio Recognition with Distributed Wireless Sensor Networks

  - **Adam Parkin, Computer Science (2010)** (co-supervised Dr. Coady)
    Educational Gems: An Exploration and Evaluation of a Visual Programming Environment
    Developer, SilkStart

  - **Steven Ness, Computer Science (2010)**
    Content-Aware Visualizations of Audio Data in Diverse Contexts

  - **Graham Percival, Interdisciplinary (2008) (co-supervised Dr. Schloss)**
    Computer-Assisted Musical Instrument Tutoring with Targeted Exercises

  - **Randy Jones, Computer Science (2008) (co-supervised Dr. Schloss)**
    Intimate Control for Physical Modeling Synthesis. CEO Madrona Labs Inc

- **Neil Burroughs, Computer Science (co-supervised Dr. Nigel Horspool) (2006-2008)** *Model of Time in Audio Processing Environments*
  PhD graduate student at the University of Victoria, Canada

- **Aaron Hechmer (2004-2006)**
  Logo Rhythms: A Sound Synthesis and Computer Audition API for the Open Source UCB Logo Interpreter

- **Past MSc, PhD Students (not completed)**

  - **Anthony Theocharis**, MSc Computer Science, 2010-2013
  - **Tony Antoniou (co-supervised with Dr. Shpak)**, PhD Electrical and Computer Engineering, 2009-2013
  - **Lacey Antoniou** , MSc Computer Science, 2006-2011
  - **Jennifer Murdoch**, MSc Computer Science, 2005-2008
  - **Richard White**, MSc Computer Science, 2006-2014
  - **Alexander Verspoor-Dawn**, MSc Computer Science, 2007-2008

- **International Visiting Students**

  - **Fabrizio Pedersoli**, Italy, 5 months, 2014
  - **Clement Laroche**, France, 12 months, 2013-2014
  - **Tiago Tavares**, Brazil, 12 months, 2011-2012
  - **Norman Krell**, Germany, 5 months, 2010
  - **Peter van Kranenburg**, Netherlands, 3 months, 2009
  - **Emiru Tsunoo**, Japan, 2 months, 2008
  - **Luis Gustavo Martins**, Portugal, 3 months, 2007
  - **Luis Teixeira**, Portugal, 3 months, 2006
  - **Luis Gustavo Martins**, Portugal, 3 months, 2006

Tutorials at International Conferences

- **Bayes and Markov listen to music** *European Signal Processing Conference (EUSIPCO), 2017*

- **Why is Greek music interesting? Towards an ethics of MIR, (co-presented with Andre Holzapfel)** *Int. Conf. of the Society for Music Information Retrieval (ISMIR), 2014*

- **Blending the Physical and the Virtual in Music Technology: From Interface Design to Multi-modal Signal Processing, (co-presented with Michael Lyons)** *ACM Multimedia Conference (ACMMM), 2013*

- **Multi-model user interfaces - A New Musical Instrument perspective**, (co-presented with Sidney Fels) *Int. Conf. on Audio, Speech and Signal Processing (ICASSP), 2013*

- **Music Information Retrieval - Theory and Applications**, *ACM Multimedia, Beijing, China, 2009*

- **Audio Analysis and Retrieval**, *Computing in the Humanities, Arts, and Social Sciences Workshop, San Diego SuperComputer Center, 2007*

- **Music Information Retrieval**, *Int. Conf. on Multimedia and Expo (ICME), Toronto, Canada, 2006*

- **MIR for audio signals using Marsyas 0.2**, *Int. Conf. on Music Information Retrieval (ISMIR, Victoria, Canada, 2006*

- **Music Information Retrieval**, *Int. Conf. on Acoustics, Speech and Signal Processing (ICASSP), Montreal, Canada, 2005*

- **Software Frameworks for Analysis for Audio and Music Signals** (with Xavier Amatriain) *Int. Conf. on Music Information Retrieval (ISMIR), Barcelona, Spain, 2004*

- **Music Information Retrieval**, *Int. Computer Music Conference (ICMC), Miami, USA, 2004*

- **Audio Feature Extraction**, *IEEE Int. Conf. on Mulimedia and Expo (ICME), Taipei, Taiwan 2004*

- **Music Information Retrieval for Audio Signals**, *Int. Conference on Music Information Retrieval (ISMIR), Baltimore, USA, 2003*

- **Music Information Retrieval for Audio Signals**, *Int. Conference on Music Information Retrieval (ISMIR), Paris, France, 2002*

- **Music Information Retrieval using Audio Representations**, *European Conference on Digital Libraries (ECDL), Trodheim, Norway 2003*

Invited Lectures and Presentations

- **Keynote: A music perspective to blending the physical and virtual in human computer interaction** *Audio Mostly, Thessaloniki, 2015*

- **Machine Learning Challenges in Music Technology** *Center for Music Technology, Georgia Institute of Technology*

- **Machine Learning Challenges in the Computer Analysis of Music** *University of Calgary, Calgary, Canada, 2013*

- **Physical Modelling Beyond Sound Synthesis: three case studies** *Aalto University, Helsinki, Finland, 2013*

- **Physical Modelling Beyond Sound Synthesis: three case studies** *University of Pompeu Fabra, Barcelona, Spain, 2013*

- **Bleeding the virtual into the physical world in computer music** *Alberta College of Art and Design (ACAD), 2012*

- **Virtual bowing, surrogate sensors, and robotic musicianship: unconventional music information retrieval** *Dept. of Computer Science, Northwestern Univ., 2012*

- **Virtual bowing, surrogate sensors, and robotic musicianship: unconventional music information retrieval** *Dept. of Computer Science, U. of Illinois, Urbana/Champaign, 2012*

- **Music Information Robotics** *Department of Electrical and Computer Engineering, McGill University, Canada, 2012*

- **Stacking in music tag annotation** *Workshop on Processing Large Amounts of Music Data, Centre for Interdisciplinary Research in Music Media and Technology (CIRMMT), McGill University, Canada, 2012*

- **New trends in multimedia signal processing: a music perspective** *Panelist at IEEE Int. Workshop on Multimedia Signal Processing (MMSP), Banff, Canada, 2012*

- **Practical machine learning solutions to the challenge of annotating large audio archives** *Information Theory and Applications (ITA), Univ. of California San Diego (UCSD), 2011*

- **Pitch Representations, Analysis and Applications** *Full day workshop at the Computer Center for Research in Music and Acoustics (CCRMA), Stanford University, 2011*

- **Self-Organizing Music Tag Clouds, Geo-Shuffling and Robotic Musicianship** *Facebook, 2011*

- **Automatic rhythm analysis for audio signals**, *CREATE, University of California, Santa Barbara, 2011*

- **Automatic rhythm analysis for audio signals**, *Hearing Seminar, Computer Center for Research in Music and Acoustics (CCRMA), Stanford Univeristy, 2011*

- **Automatic rhythm analysis for audio signals**, *Google Research, Mountain View, USA, 2011*

- **Rats, monks, whales and music tags: content-aware user interfaces for audio signals**, *Google Research, Mountain View, USA and Google Music, China 2009*

- **Rats, monks, whales and music tags: content-aware user interfaces for audio signals**, *CCRMA, Stanford, USA, 2009*

- **Rats, monks, whales and music tags: content-aware user interfaces for audio signals**, *Mozilla Foundation, 2009*

- **Computational Ethnomusicology - Expanding the reach of Music Information Retrieval to the musics of the world** , *BIRS Workshop on Multimedia and Mathematics II, Banff, Canada, 2009*

- **Content and Context Aware User Interfaces for Exploring Large Music Collections**, *INESC, Lisbon, Portugal, 2009*

- **Marsyas 10 years of open source development for audio research**, *INESC, Porto, Portugal, 2009*

- **Novel interfaces for music creation and listening**, *Catolica University, Porto, Portgual, 2009*

- **Taking music apart: Music Information Retrieval beyond timbral statistics**, *Computer Science Department, Simon Fraser University, 2008*

- **Taking music apart: Music Information Retrieval beyond timbral statistics**, *Colloquium, Electrical Engineering Department, University of Washington, 2007*

- **A framework for predominant melodic sound source separation using spectral clustering**, *Microsoft Research, Redmond, 2007*

- **Marsyas: a framework for audio processing**, *CrestMuse Project, Osaka, Japan*

- **Taking music apart: Music Information Retrieval beyond timbral statistics**, *CrestMuse Project, Kwansei-Gakuin University, Japan*

- **Machine Learning for "real-life" audio analysis**, *Workshop on Evaluation Methods for Machine Learning, 22 AAAI Conf. on Artificial Intelligence (AAAI-07), Vancouver, Canada, 2007*

- **A Personal History of Music Information Retrieval**, *BIRS Workshop on Multimedia and Mathematics, Banff, Canada, 2005*

- **Music and Human Computer Interaction**, *Vancouver, Studies in Cognitive Science, Canada, 2005*

- **The Future of Music Software**, *University of Pompeu Fabra, Barcelona, Spain, 2005*

- **Music Retrieval**, *University of Porto, Portugal, 2004*

- **Music-Specific Audio Analysis**, *Microsoft Research, 2004*

- **Beyond Retrieval, Reflections on Musical Content**, *Workshop: Multimedia Information Retrieval in Business Applications, Franhofter Institute, Germany, 2003*

- **Music Analysis and Retrieval for Audio Signals**, *Spoken Language Systems Group, MIT Laboratory for Computer Science, 2002*

- **Manipulation, Analysis and Retrieval Systems for Audio Signals**, *Music Technology Group, Music Department, McGill University, Montreal, Canada, 2002*

- **An Overview of Audio Information Retrieval**, *Hearing Seminar, Computer Center for Research in Music and Acoustics (CCRMA), Stanford, 2001*

Scholarly and Professional Activities

- **Editorial Duties**
    - **Senior Area Editor, Joint IEEE/ACM Transactions on Speech, Audio and Language Processing**
      2013 - present
    - **Associate Editor, Springer International Journal on Multimedia Information Retrieval**
      2012 - 2014
    - **Associate Editor, IEEE Transactions on Speech, Audio and Language Processing**
      2005-2008
    - **Associate Editor, Computer Music Journal**
      2003-present
    - **Guest Editor, EURASIP Journal on Applied Signal Processing**
      Special Issue on Music Information Retrieval 2005-2006
    - **Editor, Proceedings of the 1st Workshop on Learning Semantics of Audio Signals**, 2006

- **Conference Organization**
    - **Publicity chair** IEEE Int. Workshop on Multimedia Signal Processing (MMSP), Banff, Canada, 2012

    - **Co-organizer** Int. ACM Workshop on Music Information Retrieval with User Centered and Multimodal Strategies, ACM Multimedia, Kyoto, Japan, 2012

    - **Co-organizer** Int. ACM Workshop on Music Information Retrieval with User Centered and Multimodal Strategies, ACM Multimedia, Scottsdale, Arizona, 2011

    - **Technical Program Co-Chair** Int. Conf. on Music Information Retrieval (ISMIR), Kobe, Japan, 2009

    - **Local arrangements Chair** Int. Conf. on Functional Programming (ICFP), Victoria, Canada, 2008

- **General Co-Chair** Int. Conference on Music Information Retrieval (ISMIR), Victoria, Canada, 2006
- **Publications and registration chair** IEEE Workshop on Multimedia Signal Processing (MMSP), Victoria, Canada, 2006
- **Technical Program Co-Chair** Int. Computer Music Conference (ICMC), Miami, USA, 2004
- **Organizer** Intl. ACM Workshop on Music Information Retrieval with User-Centered and Multimodal Strategies (MIRUM), (Part of ACM Multimedia), Kyoto, Japan, 2012
- **Organizer** Intl. ACM Workshop on Music Information Retrieval with User-Centered and Multimodal Strategies (MIRUM), (Part of ACM Multimedia),Scottsdale, AZ, USA, 2011
- **Organizer** Workshop on Learning the Semantics of Audio Signals (LSAS) (Part of the 1st Conference on Semantics and Digital Media Technology (SAMT)), Athens, Greece, 2006
- **Technical Program Committee** European Signal Processing Conference 2017
- **Technical Program Committee** New Interfaces for Musical Expression (NIME), Brisbanem Australia 2016
- **Technical Program Committee** IEEE Int. Conf. on Multmedia and Expo (ICME), Toronto, Canada 2006, 2013
- **Technical Program Committee** Int. Conf. on Music Information Retrieval (ISMIR), Baltimore, USA, 2003
- **Technical Program Committee** ACM Multimedia
  (Workshop on Music and Computing) Santa Barbara, USA, 2006
- **Technical Program Committee** RIAO 2007 Large Scale Semantic Access to Content, Pittsburgh, USA, 2007
- **Technical Program Chair** WIAMIS 2013 Workshop on Image and Audio Analysis for Multimedia Interactive Services, 2013

- **Technical Committees**

  - IEEE Audio and Electroacoustics (since 2004)
  - IEEE Multimedia Signal Processing (since 2009)
  - IEEE Speech and Language Processing - 2005-2008
  - Signal Analysis for Machine Intelligence (SAMI),
    International Association for Pattern Recognition (IAPR)
  - Musical Acoustics - Acoustical Society of Ameria (ASA) - 2008-2011

- **Reviewing**

  - **Grants**
    University of Lethbridge Research Fund, External Reviewer 2015
    Research Grants Council of Hong Kong, External Referee 2013
    CRC (Canada Research Chairs), External Referee for a Tier II nomination, 2012
    NSERC (Natural Sciences and Engineering Research Council of Canada)
    External Referee Collaborative Research Development Grants 2012
    External Referee Discovery Grants 2005-2013
    External Referee Strategic Grants 2007
    External Referee Idea to Innovation Grants 2007, 2009

SSHRC (Social Sciences and Humanities Research Council of Canada)
External Referee Insight Grants 2013
ANR (French National Research Agency), 2012
NOW (Netherland Organization for Scientific Research, Dutch Research Council)
- External Referee 2005, 2015
Research Committee of the University of Crete (UoC) Internal Grants - External Referee
2010
Austrian Science Fund FWF - External Referee 2007,2008, 2010, 2011, 2014-2016
Retour Post Doctorants 2009,France - External Referee 2009

– **Books**

John Wiley & Sons - Communications Technology Publishing, 2005
Oxford University Press - Handbooks, 2009
John Wiley & Sons, Communications Technology Publishing, 2010
Elsevier, Science Technology Books: Engineering, 2012

– **Journals**

PLOS One, 2017
IEEE Multimedia, 2017
IEEE Sensors Journal, 2016
Bioacoustics, 2016
MDPI Applied Sciences, 2016
ACM Transactions on Information Systems and Technology, 2016
IEEE Transactions on Knowledge and Data Engineering, 2015
SpringerPlus, 2015
IEEE Transactions on Affective Computing, 2015
IEEE Transactions on Information Systems, 2015
Musicae Scientiae, 2015
MDPI Sensors, 2015
Journal of the Acoustical Society of America (JASA) Express Letters, 2014
Journal of the Audio Engineering Society, 2013, 2016
EURASIP Journal on Audio, Speech and Music Processing, 2013, 2014, 2015
IEEE Signal Processing Magazine, 2013
Journal of Machine Learning Research (JMLR), 2013,2015
Journal of Intelligent Information Systems, 2012
Anthropologie et Socits, 2012
Advances in Multimedia, 2012
Journal of Artificial Intelligence Research, 2012, 2016
Signal, Image and Video Processing, 2010
IEEE Trans. on Affective Computing, 2010, 2012
Journal of Zhejiang University - Science, 2009
Signal Procesisng, Elsevier 2009-2012
Journal of Interdisciplinary Music Studies, 2009
Journal of Acoustical Society of America (JASA) 2004,2005,2007, 2008, 2010-2012
Informs Journal on Computing 2004
EURASIP Journal on Applied Signal Processing 2004
Computer Music Journal 2003, 2004, 2005
IEEE Trans. on Speech, Audio and Language Processing 2002-2016

IEEE Trans. on Information Systems 2003, 2006
IEEE Trans. on Signal Processing 2003, 2006, 2016
Speech Communications 2002,2005
Journal of New Music Research 2002, 2005, 2008, 2010, 2012
IEEE Trans. on Multimedia 2002,2004-2015
Machine Learning Journal 2005
ACM Transactions on Multimedia Computing, Communications and Applications 2006, 2011, 2013, 2017
Journal of the American Society for Information Science and Technology 2006
ACM Multimedia Systems Journal (Springer) 2006
Communications of the ACM, 2006
Pattern Recognition Letters, 2006
International Journal of Adaptive Control and Signal Processing, Wiley, 2006
ACM Transactions on Information Science, 2006
Software: Practice and Experience, 2007
Proceedings of the IEEE, 2007
EURASIP Journal on Advances in Signal Processing (JASP), 2007,2008
IEEE Signal Processing Letters, 2003,2008,2012-2013
Journal of Systems and Software, 2008
Information Processing and Management (Elsevier), 2008
IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI), 2008

- **Conferences**
  Audio Mostly, 2017
  International Symposium on Communications, Control, and Signal Processing, 2014
  User Interface and Software Technology (UIST), 2014
  ACM CHI Conference on Human Factors in Computing Systems, 2014, 2016
  Conf. on Computer Music Multidisciplinary Research (CMMR), 2013
  Workshop on Image and Audio Analysis for Interactive Multimedia Services (WIAMIS), 2013
  Sound and Music Computing, 2010, 2011
  Int. Conf. on Latent Variable Analysis and Signal Separation, 2010
  IEEE Int. Conf. on Multimedia and Expo (ICME), 2013-2015
  InfoVis, 2010
  Grace Hopper Conference - Phd Forum 2010
  Int. Conf. on Pattern Recognition 2010
  AAAI 2010
  ACM Multimedia - Content Track 2009, 2010
  ACM Multimedia - Music Track 2013, 2014
  Workshop on Exploring Music Information Spaces (WEMIS) - European Conf. on Digital Libraries, 2009
  Int. Symposium on Algorithms and Computation 2004
  IEEE Workshop on Applications of Signal Processing to Audio and Acoustics (WASPAA), 1999, 2001, 2003, 2016
  Int. Conf. on Auditory Display (ICAD) 2000
  Int. Conf. on Music Information Retrieval (ISMIR) 2002-2005, 2007-2010, 2012-2014
  Int. FLAIRS Conference - AI in Music and Art 2005

Int. Computer Music Conference (ICMC) 2004, 2005,2007,2008,2009-2012
Int. Conf. on Acoustics, Speech and Signal Processing (ICASSP) 2005,2007-2016
Pervasive Computing 2006
Visual Computing and Multimedia 2006
ACM SIGGRAPH 2006
New Interfaces for Musical Expression (NIME), 2006-2014
Int. Conf. on Data Engineering (ICDE) 2007
European Signal Processing Conference (EUSIPCO) 2007,2012,2013
Sound and Music Computing (SMC) 2007,2009,2011,2012
Int. Conference on Machine Learning and Applications (ICMLA) 2007-2014
Int. Multimedia Modelling Conference (MMM) 2008
36th Canadian Association for Information Science Conference (CAIS/ACSI) 2008
IEEE Int. Workshop on Semantic Learning Applications in Multimedia (SLAM) 2008
Int. Conf. on Pattern Recognition (ICPR), 2008, 2012
2nd Workshop on Learning the Semantics of Audio Signals (LSAS), 2008
Int. Conference on Multimodal Interfaces, 2008
Int. Symposium on Computer and Information Sciences, 2008
IEEE Multimedia Signal Processing (MMSP), 2009-2014

- **Memberships**
  Association for Computing Machinery (ACM) - Senior Member
  Institute of Electrical and Electronics Engineers (IEEE) Computer and Signal Processing Society - Senior Member
  Audio Engineering Society (AES)
  International Computer Music Association (ICMA)
  International Community for Auditory Display (ICAD)

Teaching Experience

- **CSC461/561 Multimedia Systems** Spring 2009

- **CSC330 Programming Languages** Spring 2004 Summer 2004,2005,2006, Fall 2008

- **SENG474 Data Mining**, Spring 2008

- **CSC110 Fundamentals of Programming I** Summer 2008

- **SENG310 Human-Computer Interaction** Spring 2005,Summer 2005

- **CSC421 Introduction to Artificial Intelligence** Spring 2005

- **SENG265 Software Development Methods** Summer 2006

- **CSC484A/584A MUS490/590 Music Information Retrieval** Spring 2005, Fall 2006, Fall 2008a

- **CSC110 Fundamentals of Programming, Summer 2008**

- **Directed Studies (17)** 2003-2006

Funding

All amounts are in Canadian dollars unless otherwise indicated.

- Wighton Engineering Product Development Fund, University of Victoria
  5000 CAD, 2016
  Robotic Percussionist for Musicians with Disabilities

- National Sciences and Engineering Research Council (NSERC) Engage Grant (PI) with Tangible Interaction Design, Inc
  25000 CAD, 2017
  Autonomous and reactive objects for sound and light generation

- MITACS Accelerate, Intern: Steven Bjornson (supervisor),
  15000 CAD , 2016
  The Aurora Lighting System

- Community-Engaged Learning Grant, University of Victoria, (PI),
  4500 CAD, 2016
  Expanding the reach of the UVic Music Information Retrieval course

- Technology Integrated Learning Grant, University of Victoria, (PI)
  5000 CAD, 2015-2016
  Music Information Retrieval online course using the Kadenze platform

- Social Sciences and Humanities Research Council (SSHRC), (co-investigator 1/20) Partnership Grant (SSHRC),
  2499197, 2014-2021
  Single Interface for Music Score Searching and Analysis

- National Sciences and Engineering Research Council (NSERC) Engage Grant (PI) with WaveDNA, Inc
  24750 CAD, 2014
  Automatic Transcription of Drum Sounds from Rhythmic Loops and Music Recordings

- National Sciences and Engineering Research Council (NSERC) Discovery Grant (PI)
  140000 CAD, 2012-2017
  Time Information for Multimedia Processing and Analysis

- Social Sciences and Humanities Research Council (SSHRC), (co-investigator 1/3) Research/Creation Grants in Fine Arts,
  184162 CAD, 2011-2013
  Integrating gesture sensing, robotic actuation, and proprioception in pitched electroacoustic percussion instruments for live music performance

- Social Sciences and Humanities Research Council (SSHRC), (co-investigator 1/4) Partnership Development Grant (SSHRC),
  197903 CAD, 2011-2013
  Single interface for music score searching and analysis

- National Sciences and Engineering Research Council (NSERC) (co-Investigator 1/3), New Media Initiative Strategic Grant,
  177300 CAD, 2009-2011
  Intelligent Human-Computer Interaction in Multimedia Performance

- CANARIE (co-Investigator (1/6))
  973000 CAD, 2009-2010
  Data from the Deep - Judgements from the Crowd

- Social Sciences and Humanities Research Council (SSHRC), Major Collaboriative Research Initiative (MCRI) (co-Investigator (1/41))
  2500000 CAD, 2009-2016
  Advance Interdisciplinary Research in Singing

- National Sciences and Engineering Research Council (NSERC) Discovery Grant (PI)
  100000, 2007-2011
  Sound Source Description for Music Information Retrieval

- Social Sciences and Humanities Research Council (SSHRC) Image, Text and Sound Technology co-PI (1/3) 37786, 2007-2008
  Computational Ethnomusicology

- Canada Foundation for Innovation (CFI) Leaders Opportunity Fund (PI)
  42538, 2005-2009
  Experimental Analysis Retrieval Laboratory for Audio-Based Environments (EARLAUBE)

- British Columbia Knowledge Development Fund (BCKDF) Matching Grant (PI)
  42538, 2005-2009
  Experimental Analysis Retrieval Laboratory for Audio-Based Environments (EARLAUBE)

- Curriculum Development Grant, Design office ,Faculty of Engineering, (PI)
  2000 CAD, 2008
  Enhancing the design component of CSC484 Music Information Retrieval

- Learning and Teaching Center Grant, University of Victoria (PI)
  6000, 2006
  Bridging Music and Programming: Music Information Retrieval

- Social Sciences and Humanities Research Council (SSHRC) Research Creation in Fine Arts Grant (co-PI 1/4)
  123440, 2004-2006
  From the Laboratory to the Concert: Applications of Gesture Research to Live Performance

- National Sciences and Engineering Research Council (NSERC) Discovery Grant (PI)
  54000, 2003-2006
  Graph Algorithms for Audio Analysis

- University of Victoria Startup Grant (PI)
  45000, 2004