Dr. Laurent PUGIN

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Switzerland

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Nationality: Swiss

CURRENT POSITION (since September 2009)

Co-Director of the Swiss RISM Office, Bern, Switzerland

EDUCATION

2001-2006	**PhD in Musicology**	
	Faculty of Arts, Geneva University, Switzerland	

2000-2002 **BSc in Computer Science**
Faculty of Science, Geneva University

1995-2000 **BA and MA in Musicology, Computing for the Humanities and Romanche**
Faculty of Arts, Geneva University

1993-1998 **BMus equivalent (Viola Teaching Diploma)**
Fribourg Conservatory, Switzerland, and Swiss Music Pedagogical Society

1989-1993 **A level equivalent (Baccalauréat and Maturité Fédérale Suisse)**
Latin and Ancient Greek branch, Collège Ste–Croix, Fribourg, Switzerland

ACADEMIC EXPERIENCE

2009 **Faculty lecturer in music technology, McGill University, Montreal, Canada**
Music Technology Area, Schulich School of Music
Graduate seminar (Master and PhD students), teaching in English

2008 **Visiting scholar, Stanford University, USA**
Center for Computer Assisted Research in the Humanities
Optimizing incipit and music metadata searching on large scale databases; investigate the feasibility of integrating music searching tools within the digital infrastructure of the RISM (Répertoire International des Sources Musicales) project

2006-2008 **Post-doctorate research fellow in music technology, McGill University**
CIRMMT and Music Technology Area, Schulich School of Music
Research and development in optical recognition of early music; project coordination and supervision (PhD and MA students); publications and grant proposal writing; presentations at international conferences;

2001-2006 **Research and teaching assistant, Geneva University**
Department of Musicology, Faculty of Arts
Research in early music printing history; participation in music edition projects; participation in music notation software development 'Wolfgang' and 'Aruspix'; computer support and development (Latex packages for critical editions, databases)

1997-1999 **Undergraduate student supervisor, Geneva University**
Department of Computing for the Humanities, Faculty of Arts
Supervision of extra-tutorial programming exercises for 2nd year course of Prof. E. Wehrli

LEADING RESEARCH PROJECT

Development of an open-source project, **Aruspix**, started in 2003 (www.aruspix.net). Aruspix is a unique music scanning software for transcribing early music prints that also has the particularity to learn and to improve itself dynamically. Its superimposition and collation tools enable music editors to compare early music editions and reprints when compiling comprehensive critical modern editions. Written in C++ (Mac OS X, Windows and Linux), it acts both as an end-user software application for musicologists and as a tool for conducting research in music philology, music encoding, digisation, machine learning and image processing.

AWARDED GRANTS IN WHICH ARUSPIX PLAYS OR PLAYED A SIGNIFICANT ROLE

- 'Marenzio online digital edition' ([NEH](NEH); Critical Edition Grant; PI Mauro Calcagno, Stony Brook University, CO-PI Giuseppe Gerbino, Columbia University, 2011-2014, USD $125,000).
- 'ECOLM III: opening historical music resources to the world's on-line researchers' (AHRC; PI Tim Crawford, Goldsmiths, University of London, 2011-2012, GBP £96,000).
- 'Printed Sacred Music in Europe, 1500-1800: Switzerland and the Alpine region as crossroads for production, circulation and reception of catholic musical repertoire' ([SNF](SNF); PI Luca Zoppelli, University of Fribourg, 2010–2013, CHF 522,715).
- 'Optical music recognition for plainchant' (SSHRC; Standard Research Grant; PI Ichiro Fujinaga, McGill University, 2010–2013; CAD $141,393).
- 'Incorporating lyrics into optical recognition technology for early vocal music sources' (SSHRC; Image, Text, Sound and Technology Grant; PI Ichiro Fujinaga, CAD $49,932).
- 'Enhancing optical music recognition technology of early music prints and manuscripts for musicological applications' (SSHRC; Image, Text, Sound and Technology Grant; PI Ichiro Fujinaga, 2007, CAD $49,943).
- 'Feasibility of digitizing early music on microfilms for the creation of large-scale content-searchable databases' (SSHRC; Standard Research Grant; PI Ichiro Fujinaga, 2005–2007, CAD $145,838).
- 'Musique baroque à Rome : étude historique, documentaire et philologique des sources' ([SNF](SNF); PI Etienne Darbellay, Geneva University, 2001–2004, CHF 332,365).

GRANTS

International inventory of musical sources (RISM) - Swiss RISM Office, [SNF](SNF) Research Infrastructure (2012–2013, CHF 918,254). CO-PI with Prof. H.J. Hinrichsen (PI), Zurich University, Switzerland.

International inventory of musical sources (RISM) - Swiss RISM Office, [SNF](SNF) Research Infrastructure (2010–2011, CHF 903,308). CO-PI with Prof. H.J. Hinrichsen (PI), Zurich University, Switzerland.

Incorporating lyrics into optical recognition technology for early vocal music sources, SSHRC Image, Text, Sound and Technology (2008, CAD $49,932). Grant writing (80%) with Prof. I. Fujinaga (PI), McGill University.

Enhancing optical music recognition technology of Early Music prints and manuscripts for musicological applications. SSHRC Image, Text, Sound and Technology (2007, CAD $49,943). Grant writing (50%) with Prof. I. Fujinaga (PI), McGill University.

INTERNATIONAL ACADEMIC SERVICES

| 2011-2013 | Advisory board member, Electronic Locator of Vertical Interval Successions (**ELVIS**) MIT, Aberdeen University, McGill University and Yale University "Dig into Data" project |
| 2011-2014 | Researcher, Single Interface for Music Score Searching and Analysis (**SIMSSA)** McGill University, University of Victoria, RISM Switzerland (SSHRC project) |

2009-2012	Coordination Committee member (elected for a three year term), **RISM** Representative of the RISM working groups (33 countries)
2009-2013	Commission mixte member, **RIdIM** (Répertoire International d'Iconographie Musicale) International Association of Music Libraries (IAML) representative (elected for a four year term)
2009-	Board member, **Music Encoding Initiative** (MEI) As of May 2009, in association with scholars from the University of Virginia, Paderborn University, and King's College University of London; supported by two NEH/DFG grants
2008-	Advisory board member, **Music Treasures Consortium** Juilliard School (lead institution), British Library, Harvard Loeb Music Library, Library of Congress, New York Public Library, and Pierpont Morgan Library
2006-	Co-director and editorial committee member, **Luca Marenzio Edition Project** In association with scholars from Stony Brook University, Columbia University, Harvard University, Geneva University, and Bologna University

TEACHING

2011	Berne University
	‣ Zur Arbeit mit musikalischen Quellen aus der Schweiz (with Prof. C. Urchueguia)
2011	Stony Brook University (NY)
	‣ Luca Marenzio's secular music (session in graduate seminar of Prof. M. Calcagno)
2008	McGill University
	‣ Music information acquisition, preservation, and retrieval (graduate seminar)
2007	McGill University
	‣ Music information retrieval (session in graduate seminar of Prof. I. Fujinaga)
2005	Geneva University
	‣ Edition musicale
	‣ Latex pour chercheurs en sciences humaines (2 sessions)
2004	Geneva University
	‣ Introduction à l'informatique musicale
	‣ Introduction à la recherche musicologique
2003	Geneva University
	‣ Editions et ré-éditions aux 16ième et 17ième siècles

PROFESSIONAL EXPERIENCE

2008-2010	**Project manager** Design and development of a digital framework at the Swiss RISM Office in collaboration with the RISM-UK (British Library); project management and supervision of two programmers and two librarians (www.rism-ch.org)
2003-	**Database analyst programmer** Migration of the Swiss RISM database (~50,000 entries); modelling and implementation of the new database; conversion of music incipits (*Plain and Easy*, MIDI, MusicXML); handling of Unicode characters

2003-	**Software developer**
	Development and maintenance of a complete software package for control of stock and client database for OffTheShelf English Bookshop in Geneva (www.offtheshelf.ch)
1998-2002	**Database analyst programmer**
	Modelling, implementation and maintenance of a database of folio manuscripts (15,000) for the Charles Bally Foundation, Switzerland
1992-2006	**Professional viola player**
	Regular posts as viola player in professional orchestras (Sinfonietta de Lausanne, Swiss Youth Chamber Orchestra, Orcherstre de Chambre de Neuchâtel, Ensemble Instrumental Romand, Kammerorchester Basel, Orchestre de Chambre de Genève, Orchestre de Chambre de Fribourg) and as chamber musician (quintets with Quatuor Terpsychordes and Quatuor Sine Nomine); founder of the Da Capo String Quartet (1992-1998)

REVIEWER ACTIVITY

‣ ACM Journal on Computing and Cultural Heritage (2010)
‣ Journal of New Music Research (2009)
‣ ISMIR (International Society on Music Information Retrieval) Conferences (2007-2012)
‣ Computer Music Journal (2006)
‣ EURASIP Journal on Applied Signal Processing & Journal on Image and Video Processing (2005-2009)

ADMINISTRATIVE SERVICES

2003-2005	Creation of the new study regulations for the Bologna process (BA and MA). Faculty of Arts, Geneva University, together with the Music Conservatoire

QUALIFICATIONS

TECHINCAL SKILLS

‣ C/C++, cross-platform GUI (wxWidgets) on Windows and OS X (expert level, see www.aruspix.net)
‣ PHP / MySQL / Javascript (expert level, see www.offtheshelf.ch)
‣ Ruby on Rails / AJAX / jQuery (expert level, see www.rism-ch.org)
‣ Electronic publishing: Latex, HTML, XHTML, CSS, XML, XPath, XSL, SVG
‣ Other programming languages regularly used: Java, Matlab, Python, Perl
‣ Image processing, document analysis
‣ Machine learning, in particular hidden Markov models
‣ Computer music encoding and processing (expert level)
‣ Library science for music documents (MARC21)
‣ Music philology and digital editing methods
‣ Text Encoding Initiative (TEI) (see docs.rism-ch.org/kapellmeisterbuch)

LANGUAGES

‣ French (mother tongue)
‣ English (fluent - FCE obtained)
‣ German (good)
‣ Italian (basics)

PUBLICATIONS

BOOK CHAPTER

L. Pugin, 'Going Digital: Finding the Right Path for Critical Music Editions', in Boccadoro, B. and Starobinski, G., (Eds), *Mélanges en l'honneur d'Etienne Darbellay.* [forthcoming].

L. Pugin, 'Music Printers at Work: Comparing Editions of Marenzio's *Primo libro di madrigali a quattro*', in Calcagno, M. and Cecchi, P., (Eds), *Luca Marenzio and the Late Renaissance Madrigal: Music, Poetry, Patronage, and Reception* (Centre d'Études Supérieures de la Renaissance, Collection Epitome musicale). Turnjout: Brepols Publishers, [forthcoming].

JOURNAL PAPERS

L. Pugin, A. Hankinson and I. Fujinaga, 'Digital preservation and access strategies for musical heritage: The Swiss RISM experience'. *OCLC Systems & Services: International Digital Library Perspectives: Special Issue on Music Information Retrieval*. Vol. *28* No. 1 (2012), pp.43–55

L. Pugin, and A. T. Geertinger, 'The Music Encoding Initiative (MEI) in cataloguing projects'. *Die Tonkunst*. Vol. 5 No. 3 (2011), pp. 289–294.

A. Hankinson, W. Liu, L. Pugin, and I. Fujinaga, 'Diva.js: A Continuous Document Viewing Interface'. *Code4Lib* [Online], Issue 4, July 2011.

L. Pugin, 'Editing Renaissance music: The Aruspix project'. *Beihefte zur Editio, Internationales Jahrbuch fur Editionswissenschaften.* Tübingen: Max Niemeyer, 2009, pp. 94–103.

L. Pugin, 'Aruspix, an automatic system for source comparison', in Hewlett, W. B. and Selfridge-Field, E. (Eds.), *Music Analysis East and West* (Computing in Musicology vol. 14). Cambridge, MA: MIT Press, 2006, pp. 49–60.

L. Pugin and C. Jeanneret, 'Wolfgang music notation software: latest developments' in: Hewlett, W. B. and Selfridge-Field, E. (Eds.), *Music Analysis East and West* (Computing in Musicology vol. 14). Cambridge, MA: MIT Press, 2006, pp. 61–72.

PUBLISHED CONFERENCE PROCEEDING PAPERS

L. Pugin, J. Kepper, P. Roland, M. Hartwig and A. Hankinson, 'Separating presentation and content in MEI'. In *Proceedings of the 13th International Society for Music Information Retrieval Conference (ISMIR 2012)*. Porto, Portugal.

A. Hankinson, W. Liu, L. Pugin, and I. Fujinaga, 'Diva: A web-based high-resolution digital document viewer'. In *Proceedings of the International Conference on Theory and Practice of Digital Libraries (TPDL 2012)*. Paphos, Cyprus.

A. Hankinson, L. Pugin, and I. Fujinaga, 'An interchange format for optical music recognition applications'. In *Proceedings of the 11th International Society for Music Information Retrieval Conference (ISMIR 2010)*, pp. 51–6. Utrecht, Netherlands.

A. Hankinson, L. Pugin, and I. Fujinaga, 'Interfaces for document representation in digital music libraries'. In *Proceedings of the 10th International Conference on Music Information Retrieval (ISMIR 2009)*, pp. 39–44. Kobe, Japan.

J. A. Burgoyne, Y. Ouyang, T. Himmelman, J. Devaney, L. Pugin, and I. Fujinaga, 'Lyric extraction and recognition on digital images of early music sources'. In *Proceedings of the 10th International Conference on Music Information Retrieval (ISMIR 2009)*, pp. 723–7. Kobe, Japan.

Y. Ouyang, J. A. Burgoyne, L. Pugin, and I. Fujinaga, 'Complex layout analysis of medieval music manuscripts for information extraction and optical recognition'. In *Proceedings of the 2009 International Computer Music Conference (ICMC 2009)*, pp. 101–4. Montreal, QC, Canada.

L. Pugin, J. Hockman, J. A. Burgoyne, and I. Fujinaga, 'Gamera versus Aruspix: Two optical music recognition approaches'. In *Proceedings of the 9th International Conference on Music Information Retrieval (ISMIR 2008)*, pp. 419–24. Philadelphia, PA, USA.

J. A. Burgoyne, J. Devaney, L. Pugin, and I. Fujinaga, 'Enhanced bleedthrough correction for early music documents with recto-verso registration'. In *Proceedings of the 9th International Conference on Music Information Retrieval (ISMIR 2008)*, pp. 407–12. Philadelphia, PA, USA.

L. Pugin, J. A. Burgoyne, and I. Fujinaga, 'MAP adaptation to improve optical music recognition of early music documents using hidden Markov models'. In *Proceedings of the 8th International Conference on Music Information Retrieval (ISMIR 2007),* pp. 513–16. Vienna, Austria.

J. A. Burgoyne, L. Pugin, C. Kereliuk, and I. Fujinaga, 'A cross-validated study of modelling strategies for automatic chord recognition in audio', in *Proceedings of the 8th International Conference on Music Information Retrieval (ISMIR 2007),* pp. 251–54. Vienna, Austria.

J. A. Burgoyne, L. Pugin, G. Eustace, and I. Fujinaga, 'A comparative survey of image binarisation algorithms for optical recognition on degraded musical sources', in *Proceedings of the 8th International Conference on Music Information Retrieval (ISMIR 2007),* pp. 509–12. Vienna, Austria.

L. Pugin, J. A. Burgoyne, and I. Fujinaga, 'Reducing costs for digitising early music with dynamic adaptation'. In *Proceedings of the European Conference on Digital Libraries (ECDL 2007),* pp. 471-74. Budapest, Hungary, September 2007.

L. Pugin, J. A. Burgoyne, and I. Fujinaga, 'Goal-directed evaluation for the improvement of optical music recognition on early music prints'. In *Proceedings of the ACM-IEEE Joint Conference on Digital Libraries (JCDL 2007),* pp. 303–04. Vancouver, BC, Canada.

L. Pugin, 'Representation and dissemination of music : Early typographic prints and digitalization', in Walton, C., and Muller, S., (Eds), *Contemporary Classical Music: Papers of the 2006 Intercongressional Symposium of the International Musicological Society.* Pretoria: Unisa Press, [forthcoming].

L. Pugin, 'Optical music recognition of early typographic prints using hidden Markov models', in *Proceedings of the 7th International Conference on Music Information Retrieval (ISMIR 2006)*, p. 53-6. Victoria, BC, Canada.

CONFERENCE PROCEEDING POSTERS

L. Pugin and C. Bacciagaluppi, 'TEI for Indexing a 19th-Century Handwritten Music Inventory'. *The 2010 Conference and Members Meeting of the TEI Consortium*, Zadar, Croatia, November 2010.

L. Pugin, C. Bacciagaluppi and L. Collarile, 'The Music Inventory Database'. *11th International Society for Music Information Retrieval Conference (ISMIR 2010)*, Utrecht, Netherlands, August 2010.

A. Hankinson, L. Pugin, G. Hanke Knaus, and I. Fujinaga, 'Web-based musical document viewer for digital music libraries', *9th International Conference on Music Information Retrieval (ISMIR 2008)*, Philadelphia, PA, September 2008.

L. Pugin, J. A. Burgoyne, and I. Fujinaga, 'Optical music recognition to digitise early music collections on a library scale', *International IAML Annual Conference*, Naples, Italy, July 2008.

L. Pugin, J. A. Burgoyne, D. Eck, and I. Fujinaga, 'Book-adaptive and book-dependent models to accelerate digitization of early music'. *NIPS Workshop on Music, Brain & Cognition*. Whisler, Canada, December 2007.

F. Pugin, L. Pugin, S. Demuylder-Mischler, Th. Berney, Ph. Morel. 'Utilisation des réseaux de neurones artificiels dans la prédiction de la sévérité des pancréatites aiguës' (poster 12.04). *SGC-SSC/ SGTHG*, Zurich.

THESIS

"Lecture et traitement informatique de typographies musicales anciennes: Un logiciel de reconnaissance de partitions par modèles de Markov cachés"*.* Faculty of Arts, Geneva University,

Musicology PhD dissertation, 2006. Supervisor: Prof. E. Darbellay. Chair: Prof. B. Boccadoro. Examiners: Prof. I. Fujinaga (McGill University), Prof. E. Selfridge-Field (Stanford University), Prof. Ch. Pellegrini, Prof. E. Wehrli

"Réalisation d'un système de superposition de partitions de musique anciennes". Faculty of Sciences, Geneva University, Computing BSc dissertation, 2001. Supervisor: Prof. T. Pun

"Canzoni per sonare, Venitia, 1608, appresso Alessandro Raveri. Une édition critique". Faculty of Arts, Geneva University, Musicology MA dissertation, 2000. Supervisor: Prof. E. Darbellay

INVITED TALKS AND PAPERS

'New Digital Projects for the Study and Dissemination of Medieval and Renaissance Music' (Panel), *American Musicological Society Annual Meeting*, New Orleans, November 2012.

'TEI and the Music Encoding Initiative', "*Texte digital & document génétique. Text Encoding Initiative et édition génétique*", *International Exploratory Workshop,* Bern, September 2012.

'From Music Metadata Catalogues to Digital Editing in MEI', *IAML Annual Conference*, Montreal, July 2012.

'Collaborative Projects in Digital Musicology: Demos and Discussion' (Study Group), *International Musicological Society Conference,* Roma, July 2012.

'The Use of METS for Delivering Digital Objects together with RISM Catalog Records', *60th Anniversary RISM Conference: Music Documentation in Libraries, Scholarship, and Practice,* Mainz, June 2012.

'Un ordinateur peut-il comprendre les règles de la notation mensuraliste?', *La nature de la partition: penser la notation en musique et en danse (journée d'étude)*, Geneva University, May 2012.

'Digital Editions for Renaissance Music: Challenges and Perspectives', Stony Brook University (NY), March 2011.

'What Can We do with a Diplomatic Transcription Linked to the Original Image?', *Renaissance Society of America,* Montreal, March 2011.

'Encoding and Representing Music within a TEI Document'. *The 2010 Conference and Members' Meeting of the Text Encoding Initiative Consortium*, Zadar, Croatia, November 2010.

'The Marenzio Project', *The Chansonniers of Nicholas Du Chemin (1549-1551): A Digital Forum for Renaissance Music Books, Workshop at the Newberry Library*, Chicago, October 2009.

'The New RISM Data Management Framework from RISM-UK and RISM-CH', *IAML Annual Conference*, Amsterdam, July 2009.

'Building a Comprehensive Digital Library for Nineteenth-Century Swiss Composers', *IAML Annual Conference*, Amsterdam, July 2009, with A. Hankinson.

'The Marenzio Project and Electronical Editions', *Knowledge Representation for Intelligent Music Processing Seminar*, Dagstuhl Schloss, Germany, January 2009.

'RISM Workshop on Cataloguing', *XVIII Congresso da Associação Nacional de Pesquisa e Pós-Graduação em Música*, Salvador de Bahia, September 2008, with G. Hanke Knaus.

'Variants in Renaissance Music Sources: the Aruspix Project', *Digital Editing between Experiment and Standardization, International Conference,* Paderborn University, Germany, December 2007.

'From Optical Recognition to Scholary Editions: The Marenzio Project', *IMS Study Group on Musical Data Computer Applications,* Zurich, July 2007.

'The Swiss-RISM Database', *RISM-meeting at the International Musicological Society Congress,* Einsiedeln, Switzerland, July 2007.

'Two Approaches to Optical Music Recognition', *College of Engineering and Architecture*, Fribourg, Switzerland, June 2006, with I. Fujinaga.

'Computer Software for Early Music Editions: A New Approach', *Music, Poetry and Patronage in Late Renaissance Italy : Luca Marenzio and the Madrigal, International Conference,* Harvard University, April 2006.

'Aruspix Application Software', *Luca Marenzio e il madrigale romano,* Accademia di Santa Cecilia*,* Roma, September 2005.

'RISM-Switzerland and its Database', *IAML Annual Conference*, Warsaw, July 2005.

OTHER CONFERENCES ATTENDED

‣ TEI 11th Annual Conference and Members Meeting, October 2011, Würzburg, Germany.
‣ American Musicological Society Meeting. November 2007, Quebec City, Canada.
‣ International Musicological Society Conference. July 2007, Zurich, Switzerland.
‣ American Musicological Society / Society of Music Theory Meeting. November 2006, Los Angeles.
‣ 6th International Conference on Music Information Retrieval (ISMIR 2005). September 2005, London.

OTHER

2006   Vice-champion in Quebec annual provincial wine tasting competition

2001-2002   Chamber Music Class (Geneva Conservatory) and Masterclass
            Gabor Takács (Takács Quartet) and Martin Lovett (Amadeus Quartet)

SELECTED REPERTOIRE OF CHAMBER MUSIC PERFORMED IN CONCERT

‣ Bach, 'Die Kunst der Fuge' (Excerpts), BWV 1080
‣ Beethoven, String quartet in F major, 'Rasumovsky', Op. 59 No. 1
‣ Brahms, String quartet in A minor, Op. 51 No. 2
‣ Brahms, Quintet for clarinet and strings in B minor, Op. 112
‣ Bruckner, String quintet in F major, WAB 112
‣ Dvorak, String quartet in F major, 'American', Op. 96
‣ Haydn, String quartet in D major, Op. 20 No. 4
‣ Haydn, String quartet in D major 'The Lark', Op. 64 No. 5
‣ Haydn, String quartet in B flat major, 'Sunrise', Op. 76 No. 4
‣ Mendelssohn, String quartet in E flat major, Op. 12 No. 1
‣ Mendelssohn, String quartet in A minor, Op. 13 No 2
‣ Mendelssohn, String quartet in F minor, Op. 80 No. 6
‣ Mozart, String quartet in G major, KV 387
‣ Mozart, String quartet in C major, 'Dissonance', KV 465
‣ Mozart, String quintet in C major, KV 515
‣ Mozart, String quintet in G minor, KV 516
‣ Mozart, Adagio and fugue in C minor, KV 546
‣ Mozart, Quintet for clarinet and strings in A major, KV 581
‣ Puccini, 'Crisantemi' for string quartet
‣ Schoenberg, String sextet, 'Verklärte Nacht', Op. 4
‣ Schubert, Ouverture in C minor, D 8
‣ Schubert, String quartet in A minor, 'Rosamunde', D 804, Op. 29
‣ Schumann, Quintet for piano and strings in E flat major, Op. 44
‣ Shostakovich, Quintet for piano and strings, Op. 57
‣ Shostakovich, String quartet in C minor, Op. 110