

# Anna Xambó

BA, MA, MSc, PhD

Center for Digital Music  
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## Current Position

*Postdoctoral Research Assistant*, Center for Digital Music, School of Electronic Engineering and Computer Science, Queen Mary University of London (QMUL).

## Areas of Interest

Design of Digital Musical Instruments (DMIs) • Real-time Interactive Systems for Music Performance • Human-Computer Interaction • Interaction Design • Tangible, Physical & Social Computing • Computer-Supported Collaborative, Participatory & Improvisation Music • Live Coding • Real-time Music Information Retrieval and Machine Learning • Multichannel Spatialization • Generative & Algorithmic Music • Immersive Sound Experiences • Women in Music Tech • Arts & Social Sciences Research Methods • STEAM Education • Data Visualization • Creative Programming

## Education

- 2015 PhD, The Open University (OU), UK & DRA., Universitat Pompeu Fabra (UPF), Spain.  
Major: Music computing & HCI.  
Dissertation: *Tabletop Tangible Interfaces for Music Performance: Design and Evaluation*.
- 2008 MSc in Information, Communication and Audiovisual Media Technologies, UPF, Spain.  
Major: Music computing & HCI.  
Dissertation: *Interfaces for Sketching Musical Compositions*.
- 1999 MASTER in Video, Animation and Multimedia Design, Media Art Institute Fak d'Art, Spain.
- 1996 BA, MA in Social and Cultural Anthropology, Universitat de Barcelona (UB), Spain.

## Dissertation

Title **Xambó, A.** (2015). *Tabletop Tangible Interfaces for Music Performance: Design and Evaluation*.  
Advisors Dr Robin Laney, Mr Chris Dobbyn and Prof Sergi Jordà.  
Examiners Prof Eduardo Reck Miranda and Dr Janet van der Linden.  
Website <http://oro.open.ac.uk/42473/>

## Music Education

### CLASSICAL TRAINING

- 1983–1987 PIANO, Conservatori Superior de Música del Liceu, Barcelona.  
1982–1988 MUSIC THEORY & SOLFEGE, Conservatori Superior de Música del Liceu, Barcelona.

### WORKSHOPS

- 2014 TALLER COMPOSICIÓN ACUSMÁTICA (Acousmatic Composition Workshop). Beatriz Ferreyra. Barcelona.  
2012 SÍNTESI NO ESTÀNDARD: TÈCNIQUES, ESTÈTIQUES, EXTENSIONS (Non-Standard Synthesis: Techniques, Aesthetics, Extensions). Luc Döbereiner. Barcelona.  
2009 TALLER CONSTRUEIX EL TEU PROPI SINTETITZADOR (Build Your Own Synthesizer Workshop). Tom Bugs. Barcelona.  
2008 SMC SUMMER SCHOOL. Xavier Serra, Marc Leman, Benjamin Knapp, and the Casa Paganini - InfoMus Lab. Genoa, Italy.  
2006 EL MÓN COM A INSTRUMENT (The world as an instrument). Francisco López. Barcelona.  
1998 IMPROVITZACIÓ MÈTODE COBRA (Cobra Improvisation Method). Orquestra del Caos. Barcelona.

## Teaching Education

- 2018–present LEARNING AND TEACHING IN HIGHER EDUCATION. Taught by Emma Kennedy. QMUL. London.  
2017 COMMUNICATION SKILLS FOR TEACHING FOR INTERNATIONAL FACULTY, POSTDOCS, AND VISITING SCHOLARS. Taught by Katherine Samford. Georgia Institute of Technology (Georgia Tech). Atlanta, GA, USA.

## Employment

- 10/2017–present POSTDOCTORAL RESEARCH ASSISTANT. Center for Digital Music, School of Electronic Engineering and Computer Science, Queen Mary University of London.  
07/2015–09/2017 POSTDOCTORAL FELLOW. Center for Music Technology | Digital Media Program, Georgia Tech.  
08/2013–09/2014 RESEARCH FELLOW. London Knowledge Lab, UCL Institute of Education. London.  
02/2004–06/2010 CO-FOUNDER, PROJECT MANAGER, WEB DESIGNER & WEB DEVELOPER. Nodular Soft. Barcelona.  
01/2008–07/2009 WEB DESIGNER & WEB DEVELOPER PROJECT OFFICER. Music Technology Group, UPF. Barcelona.  
11/2007–06/2009 WEB DESIGNER & WEB DEVELOPER PROJECT OFFICER. Uaalah!l. Barcelona.  
08/2005–09/2006 WEB DESIGNER & MOTION GRAPHIC DESIGNER. CCRTVi | TV3 Interactiva. Sant Just Desvern, Barcelona.  
05/2001–08/2002 WEB DESIGNER & MOTION GRAPHIC DESIGNER. TerraNetworks | UranoFilms. Barcelona.  
04/2000–05/2001 WEB DESIGNER & MOTION GRAPHIC DESIGNER. MediaPark | ParkNet, Barcelona.

## Honors & Awards

### RESEARCH HONORS & AWARDS

- 2017 NCWIT Engagement Excellence Award (\$5,000 cash award) to Greg Hendler, Léa Ikkache, Brandon Westergaard, Anna Xambó, Doug Edwards, Brian Magerko, and Jason Freeman (Earsketch), Georgia Tech.  
10/2010–07/2013 FULLY-FUNDED FULL-TIME OU PhD SCHOLARSHIP. The Open University, Milton Keynes, UK.  
03/2010–06/2010 FULLY-FUNDED OU VISITING RESEARCH STUDENTSHIP. The Open University, Milton Keynes, UK.

## ARTISTIC GRANTS, HONORS & AWARDS

05/2004 FIRST PRIZE AWARD MINIMA FESTIVAL. Gandía, Spain.  
Category: Experimental Video.  
Project: “Cosmogonias”.  
Role: Creator & Director.

## Grants & Funding

### PRINCIPAL INVESTIGATOR

11/2003-10/2004 TEACHING INNOVATION PROJECT GRANT  
Funding body: Fundació Caixa de Sabadell.  
Project: “Crossmedia infantil: Estudio sobre las nuevas tecnologías y la comunicación audiovisual en la escuela infantil y primaria (Crossmedia for Children: New Technologies and Audiovisual Communication in Primary Education)”.  
Role: PI.  
Collaborators: Eladi Martos (Co-PI), UB.  
Total Dollar Amount: \$3,300  
Candidate’s Share: 50% (\$1,650)

### COLLABORATOR

09/2016-08/2020 ADVANCING INFORMAL STEM LEARNING GRANT  
Funding body: National Science Foundation (NSF).  
Project: “Collaborative Research: Mixing Learning Experiences for Computer Programming Across Museums, Classrooms, and the Home Using Computational Music”. Award Number: 1612644.  
Organization: Georgia Tech Research Corporation.  
Role: Postdoctoral Fellow and Co-Writer of the grant proposal.  
Collaborators: Brian Magerko (PI), Jason Freeman (Co-PI), Mike Horn (Co-PI).  
Total Dollar Amount: \$2,517,690.00

### FUNDRAISER

05/2016-05/2017 WOMEN IN MUSIC TECH  
Role: Co-Founder & Co-Chair of the organization, Co-Organizer of the event.  
Total Fundraised Dollar Amount: \$11,450

08/2016-05/2017 **2016-2017 Academic Year**  
Funding body: School of Music, Georgia Tech.  
Total Dollar Amount: \$2,500

08/2016-11/2016 **Fall 2016 Concert Event**  
Funding body: College of Design, Georgia Tech.  
Total Dollar Amount: \$2,000  
Funding body: ADVANCE program, Georgia Tech.  
Total Dollar Amount: \$1,000  
Funding body: Women’s Resource Center, Georgia Tech.  
Total Dollar Amount: \$250

01/2017-05/2017 **Spring 2017 Actions**  
Funding body: School of Music, Georgia Tech.  
Total Dollar Amount: \$2,400

Funding body: College of Design Council Diversity, Georgia Tech.

Total Dollar Amount: \$1,500

Funding body: ADVANCE Program, Georgia Tech.

Total Dollar Amount: \$1,000

Funding body: Women's Resource Center, Georgia Tech.

Total Dollar Amount: \$500

Funding body: Digital Media Program, School of Literature, Media, and Communication, Georgia Tech.

Total Dollar Amount: \$300

#### CREATOR | DIRECTOR

09/2001–08/2002 AUDIOVISUAL PRODUCTION GRANT

Funding body: Departament de Cultura de la Generalitat de Catalunya (Department of Culture of Catalan Government).

Project: "Transdata Pr."

Role: Creator, Video Editor & Director.

Collaborators: Gerard Roma (music), Oscar Abril Ascaso (essay).

Total Dollar Amount: \$3,300

Candidate's Share: 50% (\$1,650)

09/1998–08/1999 AUDIOVISUAL PRODUCTION GRANT

Funding body: Departament de Cultura de la Generalitat de Catalunya (Department of Culture of Catalan Government).

Project: "Mitösömä".

Role: Creator, Animation Editor & Director.

Collaborators: Gerard Roma (music).

Grant Amount: 3,000€ (\$3,335)

Candidate's Share: 50% (\$1,650)

## Research Profiles

- [Scholar Google](#)
- [Open Research Online](#)
- [Academia.edu](#)
- [ResearchGate](#)

## Publications

### BOOKS

- 2004 **Xambó, A.** (2004). *Herramientas De Diseño Digital / Digital Design Tools*. Madrid: Anaya-Multimedia. ISBN 8441516979.

### PEER-REVIEWED BOOK CHAPTERS

- 2016 **Xambó, A.** (2017), "Embodied Music Interaction: Creative Design Synergies Between Music Performance and HCI". In Price, S. and Broadhurst, S. eds. *Digital Bodies: Creativity and Technology in the Arts and Humanities*. Palgrave Macmillan, London. pp. 207–220. ISBN 9781349952410.

- 2013 **Xambó, A.**, Laney, R., Dobbyn, C. and Jordà, S. (2013). "Video Analysis for Evaluating Music Interaction: Musical Tabletops". In Holland, S., Wilkie, K., Mulholland, P. and Seago, A. eds. *Music and Human-Computer Interaction*. Springer, London. pp. 241–258. ISBN 9781447129905.

#### JOURNAL ARTICLES

- 2016c **Xambó, A.**, Hornecker, E., Marshall, P., Jordà, S., Dobbyn, C. and Laney, R. (2016). "Exploring Social Interaction with a Tangible Music Interface". *Interacting with Computers*.
- 2016b Jewitt, C., Price, S., **Xambó, A.** (2016). "Conceptualising and Researching the Body in Digital Contexts: Towards New Methodological Conversations Across the Arts and Social Sciences". *Qualitative Research*.
- 2016a Jewitt, C., **Xambó, A.** and Price, S. (2016). "Exploring Methodological Innovation in the Social Sciences: The Body in Digital Environments and the Arts". *International Journal of Social Research Methodology*.
- 2013b **Xambó, A.**, Hornecker, E., Marshall, P., Jordà, S., Dobbyn, C. and Laney, R. (2013). "Let's Jam the Reactable: Peer Learning during Musical Improvisation with a Tabletop Tangible Interface". *ACM Transactions on Computer-Human Interaction*, 20(6), pp. 36:1–36:34.
- 2013a Bogdanov, D., Haro, M., Fuhrmann, F., **Xambó, A.**, Gómez, E. and Herrera, P. (2013). "Semantic Audio Content-based Music Recommendation and Visualization based on User Preference Examples". *Information Processing & Management*, 49(1), pp. 13–33.

#### PEER-REVIEWED CONFERENCE PAPERS

- 2017d **Xambó, A.**, Shah, P., Roma, G., Freeman, J., Magerko, B. (2017) "Turn-taking and Chatting in Collaborative Music Live Coding". In *Proceedings of the Audio Mostly Conference (AM '17)*. London.
- 2017c Roma, G., **Xambó, A.**, Freeman, J. (2017) "Handwaving: Gesture Recognition for Participatory Mobile Music". In *Proceedings of the Audio Mostly Conference (AM '17)*. London.
- 2017b Roma, G., **Xambó, A.**, Freeman, J. (2017) "Loop-aware Audio Recording for the Web". In *Proceedings of the Web Audio Conference 2017 (WAC '17)*. London
- 2017a **Xambó, A.**, Drozda, B., Weisling, A., Magerko, B., Huet, M., Gasque, T., Freeman, J. (2017) Experience and Ownership with a Tangible Computational Music Installation for Informal Learning. In *Proceedings of the Tangible, Embedded, and Embodied Interaction Conference (TEI '17)*. Yokohama, Japan. pp. 351–360.
- 2016b Freeman, J., Magerko, B., Edwards, D., Miller, M., Moore, R., **Xambó, A.** (2016). "Using EarSketch to Broaden Participation in Computing and Music". In *Proceedings of the 13th Sound and Music Computing Conference (SMC 2016)*. Hamburg, Germany. pp. 156–163.
- 2016a **Xambó, A.**, Freeman, J., Magerko, B., Shah, P. (2016). "Challenges and New Directions for Collaborative Live Coding in the Classroom". In *Proceedings of the International Conference of Live Interfaces (ICLI 2016)*. Brighton, UK.
- 2014 **Xambó, A.**, Roma, G., Laney, R., Dobbyn, C. and Jordà, S. (2014). "SoundXY4: Supporting Tabletop Collaboration and Awareness with Ambisonics Spatialisation". In *Proceedings of the International Conference on New Interfaces for Musical Expression 2014 (NIME '14)*. London. pp. 249–252.
- 2013 Bogdanov, D., Haro, M., Fuhrmann, F., **Xambó, A.**, Gómez, E. and Herrera, P. (2013). "A Content-based System for Music Recommendation and Visualization of User Preferences Working on Semantic Notions". In *IEEE 9th International Workshop on Content-Based Multimedia Indexing (CBMI '13)*. Madrid. pp. 249–252.
- 2012 Roma, G., **Xambó, A.**, Herrera, P. and Laney, R. (2012). "Factors in human recognition of timbre lexicons generated by data clustering". In *Proceedings of the 9th Sound and Music Computing Conference (SMC 2012)*. Copenhagen, Denmark. pp. 23–30.
- 2011c **Xambó, A.**, Laney, R., Dobbyn, C. and Jordà, S. (2011). "Multi-touch Interaction Principles for Collaborative Real-time Music Activities: Towards a Pattern Language". In *Proceedings of the International Computer Music Conference (ICMC '11)*. Huddersfield, UK. pp. 403–406.

- 2011b **Xambó, A.**, Laney, R. and Dobbyn, C. (2011). "TOUCHtr4ck: Democratic Collaborative Music". In *Proceedings of the Tangible, Embedded, and Embodied Interaction Conference (TEI '11)*. Funchal, Madeira. pp. 309–312.
- 2011a Milne, A. J., **Xambó, A.**, Laney, R., Sharp, D. B., Prectl, A. and Holland, S. (2011). "Hex Player — A Virtual Musical Controller". In *Proceedings of the International Conference on New Interfaces for Musical Expression (NIME '11)*. Oslo, Norway. pp. 244–247.
- 2010b Laney, R., Dobbyn, C., **Xambó, A.**, Schirosa, M., Miell, D., Littleton, K. and Dalton, N. (2010). "Issues and Techniques for Collaborative Music Making on Multi-touch Surfaces". In *Proceedings of the 7th Sound and Music Computing Conference (SMC 2010)*. Barcelona. pp. 146–153.
- 2010a Haro, M., **Xambó, A.**, Fuhrmann, F., Bogdanov, D., Gómez, E. and Herrera, P. (2010). "The Musical Avatar: A Visualization of Musical Preferences by means of Audio Content Description". In *Proceedings of the 5th Audio Mostly Conference (AM '10)*. Piteå, Sweden.
- 2008 Roma, G. and **Xambó, A.** (2008). "A Tabletop Waveform Editor for Live Performance". In *Proceedings of the International Conference on New Interfaces for Musical Expression (NIME '08)*. Genoa, Italy.

#### PEER-REVIEWED ABSTRACTS WITH PROCEEDINGS

- 2018b Skach, S., **Xambó, A.**, Turchet, L., Stolfi, A., Stewart, B., Barthet, M. (2018). "Embodied Interactions with E-Textiles and the Internet of Sounds for Performing Arts". In *Proceedings of the Twelfth International Conference on Tangible, Embedded, and Embodied Interaction (TEI '18)*. Stockholm, Sweden. pp. 80–87.
- 2018a Weisling, A., **Xambó, A.** (2018). "Beacon: Exploring Physicality in Digital Performance". In *Proceedings of the Twelfth International Conference on Tangible, Embedded, and Embodied Interaction (TEI '18)*. Stockholm, Sweden. pp. 586–591.
- 2017a **Xambó, A.**, Roma, G. (2017). "Hyperconnected Action Painting". In *Proceedings of the Web Audio Conference 2017 (WAC '17)*. London.
- 2016c Tsuchiya, T., **Xambó, A.**, Freeman, J. (2016). "Adapting DAW-driven Musical Language to Live Coding: A Case Study in EarSketch". In *Late-Breaking Demo of the Second International Conference on Live Coding (ICLC '16)*. Hamilton, Canada.
- 2016b **Xambó, A.**, Lerch, A., Freeman, J. (2016). "Learning to Code Through MIR". In *Extended abstracts for the Late-Breaking Demo Session of the 17th International Society for Music Information Retrieval Conference (ISMIR 2016)*. New York.
- 2016a Roma, G., **Xambó, A.**, Freeman, J. (2016). "Do the Buzzer Shake". In *International Conference of Live Interfaces (ICLI 2016)*. Brighton, UK.
- 2015 Freeman, J., Magerko, B., Edwards, D., Moore, R., McKlin, T., **Xambó, A.** (2015). "EarSketch: A STEAM Approach to Broadening Participation in Computer Science Principles". In *Proceedings of the IEEE Research in Equity and Sustained Participation in Engineering, Computing, and Technology (RESPECT '15)*. Charlotte, NC. pp. 109–110.
- 2014 **Xambó, A.**, Jewitt, C., and Price, S. (2014). "Towards an Integrated Methodological Framework for Understanding Embodiment in HCI". In *Proceedings of the Extended Abstracts on Human Factors in Computing Systems (CHI '14)*. Toronto. pp. 1411–1416.

#### POSITION & WORKSHOP PAPERS

- 2017 **Xambó, A.**, Roma, G., Shah, P., Freeman, J., Magerko, B. (2017) "Computational Challenges of Co-creation in Collaborative Music Live Coding: An Outline". 2017 Co-Creation Workshop at the International Conference on Computational Creativity. Atlanta, GA, USA.
- 2012 **Xambó, A.**; Laney, R.; Dobbyn, C. and Jordà, S. (September 11, 2012). "Towards a Taxonomy for Video Analysis on Collaborative Musical Tabletops". In *BCS HCI 2012 Workshop on video analysis techniques for HCI*. Birmingham, UK.
- 2011 **Xambó, A.**; Laney, R.; Dobbyn, C. and Jordà, S. (July 4, 2011). "Collaborative Music Interaction on



Tabletops: An HCI Approach”. In *BCS HCI 2011 Workshop on When Words Fail: What can Music Interaction tell us about HCI?*. Newcastle Upon Tyne.

#### REPORTS & WORKING PAPERS

- 2008 **Xambó, A.** (2008). Interfaces for Sketching Musical Compositions. Unpublished master’s thesis. UPF.
- 2004 **Xambó, A.,** Martos, E. (2004). Crossmedia Infantil: Estudi sobre les noves tecnologies i la comunicació audiovisual a l’escola infantil i primària (Report of New Technologies and Audiovisual Communication in the Primary Education). Unpublished report. Supported by Fundació Caixa de Sabadell. In collaboration with UB.

## Talks, Panels & Oral Presentations

#### EXTERNAL

- 2017 ORAL PRESENTER. (August 24, 2017). “Turn-taking and Chatting in Collaborative Music Live Coding”. *AM ’17*. London.
- 2016b ORAL PRESENTER. (July 2, 2016). “Challenges and New Directions for Collaborative Live Coding in the Classroom”. *ICLI 2016*. Brighton, UK.
- 2016a KEYNOTE SPEAKER. (April 22, 2016). “Anna Xambó and Liz Dobson in Conversation”. *Women in Sound Women on Sound 2016: Educating girls in sound* at University of Lancaster. Lancaster, UK.
- 2015 LIGHTNING TALK SPEAKER. (August 14, 2015). “EarSketch: A STEAM Approach to Broadening Participation in Computer Science Principles”. *RESPECT 2015*. Charlotte, NC. USA.
- 2014b ORAL PRESENTER. (July 1, 2014). “SoundXY4: Supporting Tabletop Collaboration and Awareness with Ambisonics Spatialisation”. *NIME ’14*. London.
- 2014a ORAL PRESENTER. (April 30, 2014). “Let’s Jam the Reactable: Peer Learning during Musical Improvisation with a Tabletop Tangible Interface”. *CHI ’14*. Toronto, ON, Canada.
- 2013 ORAL PRESENTER. (November 11, 2013). “Tabletop Tangible Interfaces for Music Performance and Implications for Tabletop Research”. *School of Computing*, University of Kent. Kent, UK.
- 2011b ORAL PRESENTER. (August 2, 2011). “Multi-touch Interaction Principles for Collaborative Real-time Music Activities: Towards a Pattern Language”. *ICMC ’11*. Huddersfield, UK.
- 2011a ORAL PRESENTER. (July 4, 2011). “Collaborative Music Interaction on Tabletops: An HCI Approach”. *BCS HCI 2011 Workshop on When Words Fail: What can Music Interaction tell us about HCI?*. Newcastle Upon Tyne, UK.
- 2010 ORAL PRESENTER. (July 23, 2010). “Issues and Techniques for Collaborative Music Making on Multi-touch Surfaces”. *SMC ’10*. Barcelona.
- 2008c PANEL MEMBER together with Alsina, A., Ferrete, J. and Roma, G. (October 31, 2008). “Freesound, Sons de Barcelona y Freesound Radio: Proyectos colaborativos alrededor del sonido” (Freesound, Sons de Barcelona & Freesound Radio: Collaborative Projects around sound). *IV Cicle de Converses d’Antropologia Sonora*, Institució Milà i Fontanals (CSIC). Barcelona.
- 2008b PANEL MEMBER together with Alsina, A., Ferrete, J. and Roma, G. (2008). “Freesound.org, Freesound Radio i Sons de Barcelona” (Freesound.org, Freesound Radio & Sons de Barcelona). *Facultat de Belles Arts (Faculty of Fine Arts)*, Universitat de Barcelona. Barcelona.
- 2008a PANEL MEMBER together with Alsina, A., de Jong, B., Loscos, A. and Roma, G. (September 27, 2008). “Influencia de la tecnología en la evolución de la música y la industria” (Influence of the technology in the evolution of music and industry). *NetAudio*, CCCB. Barcelona. [\[video\]](#)
- 2007 ORAL PRESENTER together with Roma, G. (September 20, 2007). “A Sound Editor with a Tangible Interface”. *SCSymposium(2007)*, DCM. The Hague, The Netherlands.

## OWN INSTITUTION

- 2017b ORAL PRESENTER. (June 19, 2017). "Computational Challenges of Co-creation in Collaborative Music Live Coding: An Outline". *CCW2017: Co-Creation Workshop, ICC 2017*. Atlanta, GA, USA.
- 2017a PANEL MEMBER together with Ikkache, L. (May 4, 2017). "Women in Music Tech 2016–2017". Oral presentation and discussion. *Georgia Tech Center for Music Technology (GTCMT)*, Georgia Tech. Atlanta, GA, USA.
- 2016d LIGHTNING TALK SPEAKER. (November 2, 2016). "Tangible User Interfaces and Tabletops". *First Annual Women and Music Tech Concert and Reception*, The Garage. Atlanta, GA, USA.
- 2016c PANEL MEMBER together with Ikkache, L. and Jackson, D. (May 5, 2016). "Women in Sound." Oral presentation and discussion. *Georgia Tech Center for Music Technology (GTCMT)*, Georgia Tech. Atlanta, GA, USA.
- 2016b ORAL PRESENTER. (February 25, 2016). "Algorithmic Composition: My Personal Journey". Oral presentation as a guest speaker in Jason Freeman's *Computer Music Composition* class. GTCMT. Atlanta, GA, USA.
- 2016a ORAL PRESENTER. (January 26, 2016). "EarSketch: Computational Music Remixing for All". Oral presentation as a guest speaker in Barbara Ericson's *Educational Technology* class. College of Computing, Georgia Tech. Atlanta, GA, USA.
- 2015c ORAL PRESENTER. (September 3, 2015). "Musical Tabletops: Challenges and Opportunities for Computer-Supported Collaborative Music and HCI". *College of Architecture Research Forum*, Georgia Tech. Atlanta, GA, USA.
- 2015b ORAL PRESENTER. (August 27, 2015). "Musical Tabletops: Challenges and Opportunities for Computer-Supported Collaborative Music and HCI". *GVU Center Brown Bag Seminar Series*, Georgia Tech. Atlanta, GA, USA. [\[video\]](#)
- 2015a ORAL PRESENTER. (August 24, 2015). "Musical Tabletops: Challenges and Opportunities for Computer-Supported Collaborative Music and HCI". *GTCMT Seminar Series*, Georgia Tech. Atlanta, GA, USA.
- 2014 ORAL PRESENTER. (April 9, 2014). "Let's Jam the Reactable: Peer Learning During Musical Improvisation with a Tabletop Tangible Interface". *London Knowledge Lab*. London.
- 2013 ORAL PRESENTER. (June 2, 2013). "Tabletop Groupware for Music Performance: Design and Evaluation". *CRC PhD Student Conference 2013*, OU. Milton Keynes, UK.
- 2012 ORAL PRESENTER. (June 12, 2012). "Collaboration on Interactive Tabletops for Music Performance: An Exploratory Study". *CRC PhD Student Conference 2012*, OU. Milton Keynes, UK.
- 2011b ORAL PRESENTER. (June 16, 2011). "Tabletop Groupware for Music Performance: Design and Evaluation". *CRC PhD Student Conference 2011*, OU. Milton Keynes, UK.
- 2011a ORAL PRESENTER. (May 17, 2011). "Tabletop Groupware for Music Performance: Design and Evaluation". *2011 Doctoral Workshops Conference*, OU. Milton Keynes, UK.
- 2010b ORAL PRESENTER. (June 8, 2010). "Issues and Techniques for Collaborative Music Making on Multi-touch Surfaces". *CRC PhD Student Conference 2010*, OU. Milton Keynes, UK.
- 2010a ORAL PRESENTER. (May, 2010). "Issues and Techniques for Collaborative Music Making on Multi-touch Surfaces". *Music Research Day*, Music Research Studio, OU. Milton Keynes, UK.

## Poster Presentations, Demos & Workshops

### POSTER PRESENTATIONS & DEMOS

- 2018 DEMO PRESENTER together with Skach, S. (March 19, 2018). "Embodied Interactions with E-Textiles and the Internet of Sounds for Performing Arts". *TEI '18*. Stockholm, Sweden.
- 2017c POSTER PRESENTER. (June 22, 2017). Authors: Weisling, A. and Xambó, A. "Constructing a Conceptual Framework for Collaborative Audiovisual Performance". *ICCC '17*. Atlanta, GA, USA.
- 2017b POSTER PRESENTER. (June 22, 2017). Authors: Weisling, A., Xambó, A., Magerko, B., Roma, G.,



- Jacob, M., Bhanu, N., and Freeman, J. "TuneTable: A Tangible Computational Music Installation for Informal Learning". *ICCC '17*. Atlanta, GA, USA.
- 2017a POSTER & DEMO PRESENTER. (March 21, 2017). "Experience and Ownership with a Tangible Computational Music Installation for Informal Learning". *TEI '17*. Yokohama, Japan.
- 2016b POSTER & DEMO PRESENTER. (August 11, 2016). "Learning to Code Through MIR". *Late-Breaking Demo Session of ISMIR 2016*. New York.
- 2016a POSTER & DEMO PRESENTER together with Roma, G. (July 2, 2016). "Do the Buzzer Shake". *ICLI 2016*. Brighton, UK.
- 2015 POSTER & DEMO PRESENTER together with McKlin, T. (August 14, 2015). "EarSketch: A STEAM Approach to Broadening Participation in Computer Science Principles". *RESPECT 2015*. Charlotte, NC. USA.
- 2014 POSTER PRESENTER together with Price, S. (April 29, 2014). "Towards an Integrated Methodological Framework for Understanding Embodiment in HCI". *CHI '14*. Toronto, ON. [\[video\]](#)
- 2012 DEMO PRESENTER. (January 10, 2012). "Tangible Additive Sound Synthesis (TASS)". *Welcome to the French Embassy*, OU. Milton Keynes, UK.
- 2011d POSTER PRESENTER. (June 17, 2011). "Designing and Evaluating Interactive Systems: Musical Tabletops for Collective Music Performance". *CRC PhD Student Conference 2011*, OU. Milton Keynes, UK.
- 2011c POSTER & DEMO PRESENTER together with Milne, A. J. (May 30, 2011). "Hex Player — A Virtual Musical Controller". *NIME '11*. Oslo, Norway.
- 2011b POSTER PRESENTER. (March 8, 2011). "Designing and Evaluating Interactive Systems: Musical Tabletops for Collective Music Performance". *The Open University Poster Competition 2011*. Milton Keynes, UK.
- 2011a POSTER PRESENTER. (January 25, 2011) "TOUCHtr4ck: Democratic Collaborative Music". *TEI '11*. Funchal, Madeira.
- 2010 POSTER PRESENTER. (June 8, 2010). "Issues and Techniques for Collaborative Music Making on Multi-touch Surfaces". *CRC PhD Student Conference 2010*, OU. Milton Keynes, UK.
- 2008b POSTER PRESENTER. (June 9–11, 2010). "Interfaces for Sketching Musical Compositions". *SMC Summer School 2008*. Genoa, Italy.
- 2008a POSTER PRESENTER together with Roma, G. (June 6, 2008). "A Tabletop Waveform Editor for Live Performance". *NIME '08*. Genoa, Italy.

#### WORKSHOPS

- 2017 **Xambó, A.** (October 14, 2017). "Huddersfield Girl Geeks: Audiovisual Creative Coding with P5.js". *Kirklees Libraries*, Huddersfield, UK. Funded by Google.
- 2013 **Xambó, A.** (May 2, 2013). "Introduction to SuperCollider". *Music Computing Meeting*, OU. Milton Keynes, UK.
- 2012 **Xambó, A.**; Roma, G. and Bovermann, T. (April 15, 2012). "Tangible Musical Interfaces with SuperCollider". *SuperCollider Symposium 2012*, Goldsmiths, University of London. London.

#### WEBINARS

- 2016 **Xambó, A.** (October 28, 2016). "Debugging with EarSketch". GTCMT, Georgia Tech, Atlanta, GA, USA.

## Discography

## SOLO ALBUMS

- 2013 peterMann. *On the Go* [promo CD & FLAC/MP3 files]. Barcelona: Carpal Tunnel.  
2011 peterMann. *init* [promo CD & FLAC/MP3 files]. Barcelona: Carpal Tunnel.

## BAND ALBUMS

- 1996 La Más Fina. *Zande Phondex* [CD]. Barcelona: Apache Productions.  
1994 La Más Fina. *Como quien dice la hoja iberia extrafina* [Cassette]. Barcelona: Self-released.  
1992 Sosa's Cáustica. *Paraponera Clavata* [Cassette]. Barcelona: Murmur Town.

## PARTICIPATION IN COMPILATIONS

- 2018 peterMann. "noz-petermann" (11 min 10 sec). in *Noiselets* [MP3 files]. Barcelona: Carpal Tunnel.  
2016 peterMann. "Go wild y'all" (1 min). in *Microtopies 2016* [MP3 files]. Barcelona: Gracia Territori Sonor.  
2015 peterMann. "ldnsktho1" (1 min). In *Microtopies 2015* [MP3 files]. Barcelona: Gracia Territori Sonor.  
2010 peterMann. "init11" (3 min 29 sec). In *Electronic music from Catalonia 2010* [CD]. Barcelona: Catalan! Arts / Sonar, Barcelona.

## BROADCASTING

- 2013f peterMann's "og02". (July 28, 2013). BiP\_HOp Generation on Radio Grenouille.  
2013e peterMann's "og01", ogo5, ogo7 & ogo9. (June 23, 2013). Framework radio #426.  
2013d peterMann's "og01". (March 28, 2013). Rare Frequency on WZBC 90.3 FM Newton Boston College Radio.  
2013c peterMann's "og01" & "og10". (March 2, 2013). Onda Sonora.  
2013b peterMann's selection of *On The Go*'s tracks. (February 3, 2013). RNE Atmósfera.  
2013a peterMann's "og02". (February 2, 2013). Störung Radio 127 on ScannerFM.  
2010b peterMann's "init 10", "init 11" & "init 12". (December 18, 2010). Onda Sonora.  
2010a peterMann's "init 2". (April 12, 2010). Sismógrafo.

## Selected Performances

### SOLO PERFORMANCES

- 2017 peterMann. (January 8, 2017). Live coding session. *Noiselets: A Noise Music Microfestival*. Freedonia, Barcelona, Spain.  
2016b Xambó, A. (April 22, 2016). Live coding with EarSketch. *Women in Sound Women on Sound 2016: Educating girls in sound*. Jack Hylton Music Room, University of Lancaster. Lancaster, UK.  
2016a peterMann. (April 22, 2016). Live. *Women in Sound Women on Sound 2016: Educating girls in sound*. Jack Hylton Music Room, University of Lancaster. Lancaster, UK.  
2013 Xambó, A. (October 4, 2013). Live coding session. *Perspectives on Multichannel Live Coding*. PHONOS. Sala Polivalent, UPF. Barcelona, Spain.  
2012 peterMann. (September 20, 2012). Live. *Crispy Crunchy Creaky*. Niu. Barcelona, Spain.  
2006 peterMann. (June 10, 2006). Live. *5a Mostra Sonora i Visual | Convent Sant Agustí*. Barcelona, Spain.

## COLLABORATIVE PERFORMANCES

- 2018 Weisling, A., **Xambó, A.** (March 20, 2018). “Beacon”. *TEI*. Stockholm, Sweden.
- 2017d Brown, N., Chudy, M., Papadomanolaki, M., Wilkie, S., Pase, T., Stolfi, A., Schroeder, F., **Xambó, A.**, Ikkache, L., Freeman, J., Ganesh, S., Kerure, A., Narang, J., Tsuchiya, T. (August 25, 2017). “Transmusicking I”. *Audio Mostly* 2017.
- 2017c **Xambó, A.**, Roma, G. (August 21, 2017). “Hyperconnected Action Painting”. *Web Audio Conference* 2017.
- 2017 Weisling, A., **Xambó, A.** (May 16, 2017). “Beacon”. *NIME*. Stengade. Copenhagen, Denmark.
- 2017 Weisling, A., **Xambó, A.** (February 11, 2017). “Beacon”. *Root Signals Festival*. Georgia Southern University. Statesboro, Georgia, United States.
- 2012 pulso (Roma, G., **Xambó, A.**). (March 15, 2012). Live coding session. *Live Coding Sessions*. Niu. Barcelona, Spain.
- 2004 pulso (Roma, G., **Xambó, A.**). (May 29, 2004). Live. *Minima Festival*. Gandía, Spain.
- 2002 b4ng (Roma, G., **Xambó, A.**, Brugos, C., Clarens). (June 13, 2002). Live. *Sonar Festival*. Barcelona, Spain.

## Other Creative Products

### AWARDED MUSIC HACKS

- 2014 “crowdj”. *Music Hack Day*. Barcelona, Spain.  
Prize: Rdio prize.  
Role: Concept, part of the implementation and user interface design.  
Collaborator: Gerard Roma.
- 2012b “Soundscape Turntablism”. *Music Hack Day*. Barcelona, Spain.  
Prize: Reactable prize, Zvooq prize.  
Role: Concept, part of the implementation and tangible user interface design.  
Collaborator: Gerard Roma.
- 2012a “Soundscape DJ”. *Music Tech Fest*. London, UK.  
Prize: Warp Records prize.  
Role: Concept, part of the implementation and tangible user interface design.  
Collaborator: Gerard Roma.

### CODE

- 2018 HCI Python Utils: [github.com/axambo/hci-python-utils](https://github.com/axambo/hci-python-utils).  
Role: Concept and implementation.
- 2017–present WACastMix: [annaxambo.me/code/WACastMix](https://annaxambo.me/code/WACastMix).  
Role: Concept and implementation.
- 2016–present MIRLC: [github.com/axambo/MIRLC](https://github.com/axambo/MIRLC).  
Role: Concept and implementation.
- 2017b HAP: [github.com/axambo/HAP](https://github.com/axambo/HAP).  
Role: Concept and implementation.
- 2017a Beacon: [github.com/axambo/beacon](https://github.com/axambo/beacon).  
Role: Concept and implementation of the audio engine.
- 2016 Algonoise.: [github.com/axambo/algonoise](https://github.com/axambo/algonoise).  
Role: Concept and implementation.
- 2014 SoundXY4: The Art of Noise: [github.com/axambo/soundxy4](https://github.com/axambo/soundxy4).  
Role: Concept, implementation and tangible user interface design.

- 2012 SoundXY: [github.com/axambo/soundxy2](https://github.com/axambo/soundxy2).  
Role: Concept, implementation and tangible user interface design.

#### VIDEO CREATIONS & ANIMATION FILMS

- 2003 Xambó, A. *Cosmogonias* (3 min). Spain. Video creation | Animation film.  
2002b Xambó, A. *b.scope* (3 min). Spain. Video creation.  
2002a Xambó, A. *Transdata Pr.* (5 min). Spain. Video creation.  
2000 Xambó, A. *clubsfera* (3 min). Spain. Video creation | Animation film.  
1999 Xambó, A. *Mitösöma* (10 min). Spain. Video creation | Animation film.  
1998c Xambó, A. *Lufthansa* (3 min). Spain. Videoclip for La Más Fina.  
1998b Xambó, A. *Neila* (2 min). Spain. Video creation.  
1998a Xambó, A. *Sueños* (1 min). Spain. Video creation | Animation film.

#### INSTALLATIONS & VISUALS

- 09/2002 *I love Japan*, Circuit Festival, Barcelona.  
Role: Visuals.  
Collaborators: Urtzi Grau (director), Emma Dünner, Jorge Meneses, Ana Otero.  
03/2002–08/2002 *Astoria (cinema & restaurant)*, Barcelona.  
Role: Co-filming and visuals.  
Collaborators: Babylon Cannes (concept).  
09/2001 *Emezdensity, Second Architectural Market*, Centre de Cultura Contemporània de Barcelona (CCCB), Barcelona.  
Role: Visuals & Flash programming.  
Collaborators: Urtzi Grau (curator), Ana Otero (artistic director).

## Teaching

#### UNDERGRADUATE COURSES

- 02/2004–06/2004 Centre de la Imatge i la Tecnologia Multimèdia, Universitat Politècnica de Catalunya, Terrassa, Barcelona.  
Course: *Experimental Motion Graphics* (45 h). # Students: ~15.  
Role: Co-creation of syllabus, creation of content, instruction and assessment.  
10/2003–02/2004 BAU Escola de Disseny, Universitat de Vic, Barcelona.  
Course: *Crossmedia* (45 h). # Students: ~15.  
Role: Co-creation of syllabus, creation of content, instruction and assessment.  
11/2003–06/2004 Media Art Institute Fak d'Art, Barcelona.  
Course: *Digital Compositing with Adobe AfterEffects* (45 h). # Students: ~10.  
Role: Creation of syllabus, creation of content, instruction and assessment.  
Course: *Photography in Motion* (45 h). # Students: ~10.  
Role: Creation of syllabus, creation of content, instruction and assessment.  
Course: *Type in Motion* (45 h). # Students: ~10.  
Role: Creation of syllabus, creation of content, instruction and assessment.  
11/1999–06/2003 Media Art Institute Fak d'Art, Barcelona.  
Course: *Computer Animation* (90 h). # Students: ~15.  
Role: Creation of syllabus, creation of content, instruction and assessment.

## PROFESSIONAL COURSES

- 04/2004–05/2005 Crea Formació, Barcelona.  
Course: *Usability* (12 h). # Students: ~5.  
Role: Instruction.  
Course: *Internet Design Techniques* (12 h). # Students: ~5.  
Role: Instruction.  
Course: *Web Design with DreamWeaver* (24 h). # Students: ~5.  
Role: Instruction.  
Course: *Multimedia Content with Adobe Flash* (16 h). # Students: ~5.  
Role: Instruction.  
Course: *Flash Programming* (20 h) # Students: ~5.  
Role: Instruction.  
Course: *Theoretical Aspects in Graphic Design* (12 h). # Students: ~5.  
Role: Instruction.  
Course: *Video Edition with Adobe Premiere* (60 h) # Students: 1.  
Role: Creation of syllabus, creation of content and instruction.

## PRESCHOOL & PRIMARY SCHOOL COURSES

- 03/2004–06/2004 Escola Magòria, Barcelona.  
Course: *Crossmedia infantil* (11 h). # Students (6–7 years old): ~8.  
Role: Co-creation of syllabus, creation of content, instruction and assessment.
- 03/2004–05/2004 Escola Costa i Llobera, Barcelona.  
Course: *Crossmedia infantil* (9 h). # Students (9–10 years old): ~15.  
Role: Co-creation of syllabus, creation of content, instruction and assessment.
- 03/2004–05/2004 Escola Glòries, Barcelona.  
Course: *Crossmedia infantil* (12 h). # Students (3–4 years old): ~8.  
Role: Co-creation of syllabus, creation of content, instruction and assessment.

## Mentoring

- 05/2016–12/2017 Mentor and advisor the female graduate students of the student-led organization *Women in Music Tech*, including the Chair of the organization, Léa Ikkache, the Editor-in-Chief of the newsletter *Amruta Vidwans* and female newcomers to the organization, such as Jyoti Narang.
- 09/2015–05/2016 Co-advisor of Marc Huet and Travis Gasque (master's students in Digital Media, School of Literature, Media, and Communication) and Anna Weisling (PhD student in Digital Media, School of LMC) for their graduate design project *TuneTable*. This work has been part of Brian Magerko's Digital Media studio course at Georgia Tech. From this work we have published at TEI '17 (see Peer-Reviewed Conference Papers) and we have informed a successful and competitive NSF-funded grant (Advancing Informal STEM Learning Grant).
- 09/2015–05/2017 Co-advisor of Pratik Shah (master student in Human-Centered Computing, School of Interactive Computing) with the research and design on adding collaborative features to *EarSketch*, an online platform for learning code by making music. This work has been part of the design and development of the NSF-funded project *EarSketch*, led by Jason Freeman. From this work we have published at ICLI '16 (see Peer-Reviewed Conference Papers) and we have submitted a second conference paper and are preparing a journal article.

## Additional Experience

## CONCERTS CO-ORGANIZATION

- 2017 “Noiselets: A Noise Music Microfestival”. (January 8, 2017). Freedonia, Barcelona.
- 2016c “The First Annual Women in Music Tech: Concert and Reception”. (November 2, 2016). The Garage. Atlanta, GA, USA.
- 2016b “Audience device participation”. (April 5, 2016). *Web Audio Conference 2016*, Georgia Tech. Atlanta, GA, USA.
- 2016a “Live coding and the audiovisual web”. (April 4, 2016). *Web Audio Conference 2016*, Georgia Tech. Atlanta, GA, USA.
- 2013b “Perspectives on multichannel live coding”. (October 4, 2013). PHONOS. Sala Polivalent, UPF. Barcelona.
- 2013a “Live Coding Sessions II”. (March 22, 2013). Niu. Barcelona.
- 2012 “Live Coding Sessions”. (March 15, 2012). Niu. Barcelona.

## BLOGGING

- 2016–present [Women in Music Tech](#), the newsletter of the Women in Music Tech organization. Co-Creator, Co-Editor, Reviewer and Co-Author.
- 09/2013–08/2014 [MIDAS's Blog](#), the research blog of the MIDAS project. Co-Creator and Co-Author.
- 01/2010–12/2011 [postWIMP](#), a blog on HCI and interaction design. Co-Creator and Co-Author.
- 03/2006–03/2009 [streeTypes](#), a blog on typography in public spaces. Creator and Author.

## ARTISTIC COLLECTIVE PROJECTS

- 2008–present Co-Founder of the experimental electronic music label Carpal Tunnel. Barcelona.
- 2002 Co-Founder and Member of b4ng, a multidisciplinary collective in search of new forms of audio-visual communication. Barcelona.
- 1998–2000 Co-Founder and Member of the experimental video collective jesu13. Barcelona.

# Professional Activities

## PROFESSIONAL ORGANIZATION MEMBER

*Association for Computing Machinery (ACM).*  
*International Computer Music Association (ICMA).*

## COMMITTEE MEMBER / CONFERENCE CHAIR

- 2017c SESSION CHAIR. *WAC '17*. London.
- 2017b PROGRAMME COMMITTEE MEMBER. *Second Conference on Computer Simulation of Musical Creativity*, Open University. Milton Keynes, UK.
- 2017a LOCAL COMMITTEE MEMBER. *International Conference on Computational Creativity 2017*, Georgia Tech. Atlanta, GA, USA.
- 2016 CO-FOUNDER & CO-CHAIR. *Women in Music Tech Committee*, GTCMT, Georgia Tech. Atlanta, GA, USA.
- 2016 MUSIC/ARTWORKS CO-CHAIR. *Web Audio Conference 2016*, Georgia Tech. Atlanta, GA, USA.
- 2011 SESSION CHAIR (“Laptop/Coding/NI”). *ICMC '11*. Huddersfield, UK.
- 2011 COMMITTEE MEMBER. *CRC PhD Student Conference 2011*, OU. Milton Keynes, UK.



#### CONFERENCE REVIEWER

- 2017 *ACM Creativity and Cognition* (2017).
- 2012–2018 *ACM Designing Interactive Systems* (2012, 2016, 2018).
- 2018 *International Conference of the Learning Sciences (ICLS)* (2018)
- 2017 *ACM Innovation and Technology in Computer Science Education* (2017).
- 2011–2018 *New Interfaces for Musical Expression* (2011–2018).
- 2015–2017 *ACM Special Interest Group on Computer-Human Interaction* (2015–2017).
- 2012–2018 *ACM Tangible, Embedded and Embodied Interaction* (2012–2018).
- 2017 *Co-Creation Workshop at International Conference on Computational Creativity* (2017).
- 2017 *International Computer Music Conference – ICMC Music* (2017).
- 2013 *IEEE Interactive Tabletops and Surfaces* (2013).
- 2016 *International Conference on Live Interfaces* (2016).
- 2016 *ISSTA International Festival and Conference on Sound in the Arts, Science and Technology* (2016).
- 2018 *ACM SIGGRAPH* (2018).
- 2016 *Web Audio Conference* (2016–2017).

#### JOURNAL REVIEWER

- 2015 *International Journal of Human-Computer Studies*. Elsevier.
- 2016 *Interacting with Computers*. Oxford Journals.
- 2017 *Journal of Audio Engineering Society*. Audio Engineering Society.
- 2016 *Qualitative Research*. Sage Publications.

#### JURY MEMBER

- 2016 *MOOG Hackathon 2016*, GTCMT, Georgia Tech. Atlanta, GA, USA.

#### MUSIC JUDGE

- 2018 *Celebrating Women in Sound, 8 March 2018*, Goldsmiths University, London.
- 2017b *National Student Electronic Music Event 2017*, Louisiana State University. Baton Rouge, LA, USA.
- 2017a *EarSketch National Competition 2017*, GTCMT, Georgia Tech. Atlanta, GA, USA.

#### CONSULTANCIES

- 08/2015–10/2015 *Flux Project*, Atlanta, GA, USA.  
Consulting on the development of interactive audio components of an art project for Flux Night 2015.  
Collaborators: Jason Freeman (coordinator), Gerard Roma.

#### ENTREPRENEURSHIP

- 05/2016–12/2017 *Women in Music Tech*, Atlanta, GA, USA.  
Co-Founder and Co-Chair of *Women in Music Tech*, the first student organization at GTCMT that looks into bringing more women into the program of music technology with actions on recruitment, external communication, internal communication, and creating a safe space.
- 02/2004–06/2010 *Nodular Soft*, Barcelona.  
Co-Founder of a freelance studio focused on user-centric software and AV communication, development of community websites using several CMS, development of AV programs under specific needs, and usability consultancy.

## RESEARCH VISITS

05/2012	University of Strathclyde, Glasgow, Scotland, UK.
06/2011	University of Strathclyde, Glasgow, Scotland, UK.
04/2011–05/2011	UPF, Barcelona, Spain.
03/2010–06/2010	The Open University, Milton Keynes, UK.

## Skills

### LANGUAGES

Catalan (native or bilingual proficiency), Spanish (native or bilingual proficiency), English (full professional proficiency), German (basic level), Italian (basic level), French (basic level).

### COMPUTER SKILLS

Operating Systems: OS X, Windows and Linux desktop (Ubuntu).

Programming: Actionscript, Assembly (basic level), C, CSS, Java, JavaScript, jQuery, MySQL, PHP, Python, Web Audio, XML.

Scientific Apps: MATLAB, Octave, R, SPSS.

Version Control Systems: CVS, Git, Subversion.

Music Apps: DAWs (Ableton Live, Cubase, Reaper, Logic Pro), Max/MSP, PureData, SuperCollider, wave editors (Audacity, SoundForge, WaveEditor).

Text & Multimedia Analysis Apps: ELAN, MAXQDA, VCode.

Other Apps: Graphics and multimedia authoring apps (AfterEffects, Blender, Dreamweaver, Final Cut Pro, Flash, Freehand, Illustrator, InDesign, Photoshop, Premiere, Processing, Combustion, 3DMax), LaTeX, MS Office suite. CMS (Drupal, WordPress). Jekyll.

Hardware: Arduino, Bela.