Nicolas Bouillot, Ph.D.

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Bio

Nicolas Bouillot is a coder, artist, author and producer/director of digital experiences. He specializes in telepresence, spatial sound, artificial intelligence-assisted creation and, more generally, media installations. Now co-founder of the Lab148 cooperative, he provides technological support for digital creativity: design, coordination, prototyping, writing and code. He is the main designer and developer of the Sh4lt tool, which facilitates real-time assemblies of creative and diffusion tools.

His work has led to the presentation of several dozen productions of collective digital experiences, notably during his time at the Société des arts technologiques. He has more than 30 scientific publications to his credit.

Rooted in applied research, his prototypes have led to the development of open-source software and notable innovations such as the network of 20+ Quebec telepresence halls (Open Scenes) and the prototype of immersive spherical loudspeakers (Audiodice). He was the initiator and main developer of Switcher (a modular low-latency multichannel streaming engine) and Shmdata (a library for sharing data streams between applications). Finally, he is behind SATIE, a 3D audio rendering engine for heterogeneous speaker configurations.

He obtained a PhD from the Conservatoire National des Arts et Métiers de Paris (CNAM) in 2006. He became a postdoctoral researcher at McGill University (2007-2011). Finally, he joined the Société des arts technologiques as a researcher/developer in 2012, where he was co-director of research from 2017 to 2023.

Employment

Current Jan 2023	Cofounder Cooperative Lab148, Montreal, Research and development laboratory in immersion and telepresence
Mar 2023 Feb 2017	Research codirector Society for arts and technology [SAT], Montreal, Metalab department Leading a lab of 11 members (with Emmanuel Durand); definition of the strategic research axes; development of a short, medium and long term vision for the research; contribution to the elaboration of an intellectual property strategy based on the development of free software; design and implementation of scientific communication strategy; design and writing of submissions; development of research partnerships with artists, researchers or other types of partners development of work processes; project management and task prioritization; team evaluations; contribution to the creation of two innovation departments (valorization and immersive online dissemination); management and team building for the realization of research projects; participation in the writing, follow-up of the writing and submission of grant applications; definition and management of the actions of popularization and scientific communication of the research work; writing and management of the budgets; participation in the strategic decision-making process of [SAT]; recruitment and follow-up of agents; participation in the valorization process of Metalab's open source software
Mar 2023 Jan 2012	Researcher/developer Society for arts and technology [SAT], Montreal, Metalab department Multidisciplinary research in immersive audio and telepresence; writing of scientific papers; presentation during scientific conferences; scientific and technological watch on research topics; design of interoperable software architectures; initiation and lead developer of software libraries: shmdata (agnostic stream sharing between applications) and switcher (real-time integration environment for low latency live transmission of multiple data channels); initiation of the spatialization software SATIE (Spatial Audio Toolkit for Immersive Environments); prototypes development and design of technical demonstrations; production of demonstration videos; invention of immersive audio devices; musical composition and performance for illustration of research; implementation and participation in the code review process; technical documentation; network infrastructure diagnosis and debugging; implementation of continuous integration pipeline; assisting artists in performance and prototype production; job writing, interviewing and onboarding new team members; supervision of multidisciplinary internships; production of code refactoring analysis; deployment and building of project management tools and work process documentation; design and delivery of technical training
Feb 2012 Jan 2010	Research associate & post-doctoral researcher McGill university, Montreal, Centre for Interdisciplinary Research in Music Media and Technology (CIRMMT) Design and development of a streaming server delivering synchronized multichannel content to the web; participation to development and presentation of biannual demonstrations to *Canada's advanced research and innovation network* (CANARIE); network protocol tuning and monitoring for long distance transmission; organization and completion of experiment targeting automated audio analysis for musical gesture recognition; design and development of an audio/score alignment software; development of interactive web application; student supervision; scientific communication.

Dec 2009 Sept 2007	Post-doctoral researcher McGill university, Montreal, Centre for Intelligent Machines (CIM) Design and development of a low-latency audio streaming protocol; design and development of a packet rate congestion avoidance algorithm; architectural design and implementation of outdoor mobile multiuser applications; objective measure of streaming engines Quality of user Experience (QoE); live and simulated network performance evaluation; software integration for mobile devices; comparison of localization technologies accuracy; design and development of a mobile augmented guitar; demonstration of mobile interactive applications; scientific communication.
Aug 2007 Sept 2005	Lecturer Conservatoire National des Arts et Métiers, Paris, Centre d'étude et recherche en informatique et communication (CEDRIC) Design and development of a consistency service for a mobile multiplayer game; design and development of a distributed software enabling remote & synchronized musical interaction; design and completion of user experiment; public demonstrations of a multi-location distributed musical interaction system; university level course writing and teaching; student supervision; scientific communication.
Aug 2005 Sept 2002	Research Fellow Conservatoire National des Arts et Métiers, Paris, Centre d'étude et recherche en informatique et communication (CEDRIC) Design and development of a distributed musical interaction system; design of consistency models for distributed interactive application; performance evaluation of circular buffer in streaming application; design of consistency integration into multiplayer distributed games; organization and completion of a public demonstration at the *Institut de Recherche et Coordination Acoustique/Musique* (IRCAM); course writing and teaching; student supervision; scientific communication.

Education

Nov 2006	Ph.D. in COMPUTER SCIENCE, obtained with distinction CONSERVATOIRE NATIONAL DES ARTS ET MÉTIERS, Paris *Thesis:* "Consistency in distributed interactive multimedia applications, from distributed musical interaction to online multiplayer games" *Advisor:* Eric Gressier-Soudan *Reporters:* Jeremy R. Cooperstock, Isabelle Demeure, Michel Raynal *Assessors:* Sophie Chabridon, Gérard Florin, Cécile Leprado, Stéphane Natkin, Jean Vareille
Aug 2002	D.E.A. (equivalent to a Master degree) in COMPUTER SCIENCE, obtained with distinction UNIVERSITÉ PIERRE ET MARIE CURIE - PARIS VI *Thesis:* "The distributed orchestra: system and network constraints evaluation and prototyping" *Advisor:* Eric Gressier-Soudan
Aug 2001	Maîtrise (4th year university degree) in COMPUTER SCIENCE, obtained with distinction UNIVERSITÉ DENIS DIDEROT – PARIS VII *Thesis:* "Implementing Consensus over Failure Detectors" *Advisors:* Carole Delporte and Hugues Fauconier
Aug 2000	Licence (3rd year university degree) in COMPUTER SCIENCE, obtained with distinction UNIVERSITÉ DENIS DIDEROT – PARIS VII
Aug 1999	D.E.U.G. (2nd year university degree) in MATHEMATICS, PHYSICS AND COMPUTER SCIENCE, obtained with distinction at UNIVERSITÉ DENIS DIDEROT – PARIS VII, Paris

Selected Collective Digital Experiences

[1] Zack Settel, **Nicolas Bouillot**, Jean-Yves Munch, Carl Talbot, and Mélanie Léonard. Navigation in the montreal symphony orchestra. mmersive 3D and dome experience of live navigation in the Montreal Symphony Orchestra, 2021. `https://nicolasbouillot.net/audio/6dof-symphony/`.

[2] Luc Courchesne, Emmanuel Durand, **Nicolas Bouillot**, and Michal Seta. Drawing space. Telepresence drawing experience with volumetric capture of participants' bodies, 2013. `https://nicolasbouillot.net/telepresence/drawing-space/`.

[3] Romain Pellerin, **Nicolas Bouillot**, Tatiana Pietkiewicz, Mike Wozniewski, Zack Settel, Eric Gressier-Soudan, and Jeremy R. Cooperstock. Soundpark. Multiplayer augmented reality games, geolocalized and playable in a park., 2009. `https://nicolasbouillot.net/telepresence/sound-park/`.

Telematic Art

[1] Michal Seta, **Nicolas Bouillot**, Emmanuel Durand, Nina Ripoll, Bennett Smith, Andrew Stewart, Dirk Stromberg, and Zack Settel. Kaon'cpt: Perripplayear & as of so little space. Guided musical improvisations (comprovisations) involving a dozen musicians playing simultaneously at a distance and spread across 14 time zones. The pieces were presented during several online festivals in the USA, Canada, England, and Poland, November 2021. (60 minutes), `https://nicolasbouillot.net/telepresence/kaon/`.

[2] **Nicolas Bouillot**, Emmanuel Durand, Michal Seta, Alexandre Quessy, and Zack Settel. Waterfall music. Guided musical improvisations (comprovisations) involving three musicians and a dancer spread across two distant stages and a virtual environment that brings them together simultaneously. The piece was presented during several festivals in Austria, Canada, and England, May 2013. (17 minutes), `https://nicolasbouillot.net/telepresence/waterfall/`.

Movie

[1] **Nicolas Bouillot**. Sèmes. Fulldome film screened in the United States, Canada, and England, 2022. (5 minutes), `https://nicolasbouillot.net/audio/semes/`.

Fiction

[1] **Nicolas Bouillot**. En dronaile. Short utopian story, winner of the contest *Imagine Montreal in the Year 2140, organized by the Bieler School of Environment, McGill university*, November 2023. `https://nicolasbouillot.net/trucs/2023-mtl-2140.pdf`.

Scientific Papers

Journals

[1] Youness Salame, Pierre-Majorique Léger, Patrick Charland, Maÿlis Merveilleux Du Vignaux, Emmanuel Durand, **Nicolas Bouillot**, Mylène Pardoen, Marion Deslandes-Martineau, and Sylvain Sénécal. The effects of interactivity on learners' experience in a visually immersive display context. *Computers in the Schools*, 0(0):1–20, 2022.

[2] **Nicolas Bouillot** and Michał Seta. The KaonCPT collective: building a musical culture of not-in-real-life performance through conducted live comprovisation. *Organised Sound*, 2021.

[3] Maÿlis Merveilleux Du Vignaux, Pierre-Majorique Léger, Patrick Charland, Youness Salame, Emmanuel Durand, **Nicolas Bouillot**, Mylène Pardoen, and Sylvain Sénécal. An exploratory study on the impact of collective immersion on learning and learning experience. *Multimodal Technologies and Interaction*, 5(4), 17, 2021. Received: 2 February 2021 / Revised: 23 March 2021 / Accepted: 29 March 2021 / Published: 7 April 2021.

[4] **Nicolas Bouillot**. Type mosaicing with consultables and delegates. *Overload Journal*, (130), 2015. 5 pages.

[5] **Nicolas Bouillot**. Make and forward consultables and delegates. *Overload Journal*, (127), 2015. 5 pages.

[6] Adriana Olmos, **Nicolas Bouillot**, Trevor Knight, Nordhal Mabire, Josh Redel, and Jeremy R. Cooperstock. A high-fidelity orchestra simulator for individual musicians' practice. *Computer Music Journal*, 36(2), 2012. 18 pages.

[7] Romain Pellerin, **Nicolas Bouillot**, Tatiana Pietkiewicz, Mike Wozniewski, Zack Settel, Eric Gressier-Soudan, and Jeremy R. Cooperstock. Soundpark: Exploring ubiquitous computing through a mixed reality multi-player game experiment. *Studia Informatica Universalis journal, special issue: bests papers of the conference NOTERE 2009*, 8(3), 2010. 21 pages.

[8] **Nicolas Bouillot**, Elizabeth Cohen, Jeremy R. Cooperstock, Andreas Floros, Nuno Fonseca, Richard Foss, Michael Goodman, John Grant, Kevin Gross, Steven Harris, Brent Harshbarger, Joffrey Heyraud, Lars Jonsson, John Narus, Michael Page, Tom Snook, Atau Tanaka, Justin Trieger, and Umberto Zanghieri. AES White Paper AESTD1003V1: Best Practices in Network Audio. *Journal of the Audio Engineering Society*, 57(9), September 2009. 13 pages.

[9] **Nicolas Bouillot** and Eric Gressier-Soudan. Consistency models for distributed interactive multimedia applications. *ACM Operating Systems Review*, 38(4), October 2004. 13 pages.

[10] **Nicolas Bouillot**. The auditory consistency in distributed music performance: a conductor based synchronization. *Info/com Sciences for Decision Making (ISDM)*, 8(4), February 2004. 8 pages.

International conferences

[1] **Nicolas Bouillot**, Thomas Piquet, and Pierre Gilbert. Audiodice: an open hardware design of a distributed dodecahedron loudspeaker orchestra. In *Audio Mostly*, Edinburgh, UK, August 2023.

[2] Thomas Piquet, Hector Teyssier, Émile Ouellet-Delorme, Raphaël Duée, and **Nicolas Bouillot**. Two datasets of room impulse responses for navigation in 6 degrees of freedom: a symphonic concert hall and a former planetarium. In *25th International Conference on Digital Audio Effects DAFx20*, pages pp. 169–176, Vienna University of Music and Performing Arts (mdw), Austria, sep 2022.

[3] Émile Ouellet-Delorme, Harish Venkatesan, Emmanuel Durand, and **Nicolas Bouillot**. Live Ray Tracing and Auralization of 3D Audio Scenes with vaRays. In *18th Sound and Music Computing Conference (SMC)*, Online, June 2021.

[4] Zack Settel, Jean-Yves Munch, Gabriel Downs, and **Nicolas Bouillot**. Building Navigable Listening Experiences Based on Spatial Soundfield Capture: the case of the Orchestre Symphonique de Montréal playing Beethoven's Symphony No. 6. In *18th Sound and Music Computing Conference (SMC)*, Online, June 2021.

[5] **Nicolas Bouillot** and Michał Seta. A scalable haptic floor dedicated to large immersive spaces. In *Proceedings of the 17th Linux Audio Conference (LAC-19)*, March 2019.

[6] **Nicolas Bouillot**, Michał Seta, Émile Ouellet-Delorme, Zack Settel, and Emmanuel Durand. Rendering of heterogeneous spatial audio scenes. In *Proceedings of the 17th Linux Audio Conference (LAC-19)*, March 2019.

[7] Julien Puget, Mylène Pardoen, **Nicolas Bouillot**, Emmanuel Durand, Michał Seta, and Pascal Bastien. Rapid prototyping of immersive video for popularization of historical knowledge. In *Proceedings of the Thirteenth International Conference on Tangible, Embedded, and Embodied Interaction*, TEI '19, New York, NY, USA, 2019. ACM.

[8] Zack Settel, Peter Otto, Michał Seta, and **Nicolas Bouillot**. Dual rendering of virtual audio scenes for far-field surround multi-channel and near-field binaural audio displays. In *16th Biennial Symposium on Arts and Technology*, Ammerman Center for Arts and Technology at Connecticut College, New London, February 2018. 5 pages.

[9] François U. Brien, Emmanuel Durand, Jérémie Soria, Michał Seta, and **Nicolas Bouillot**. In situ editing (EiS) for fulldomes. In *23rd ACM Symposium on Virtual Reality Software and Technology (VRST)*, Gothenburg, Sweden, November 2017.

[10] **Nicolas Bouillot**, Zack Settel, and Michał Seta. SATIE: a live and scalable 3d audio scene rendering environment for large multi-channel loudspeaker configurations. In *New Interfaces for Musical Expression (NIME'17)*, Copenhagen, Denmark, 2017.

[11] Zack Settel, **Nicolas Bouillot**, and Michał Seta. Volumetric approach to sound design and composition using SATIE: a high-density 3D audio scene rendering environment for large multi-channel loudspeaker configurations. In *15th Biennial Symposium on Arts and Technology*, Ammerman Center for Arts and Technology at Connecticut College, New London, February 2016. 8 pages.

[12] Trevor Knight, **Nicolas Bouillot**, and Jeremy R. Cooperstock. Visualization feedback for musical ensemble practice: A case study on phrase articulation and dynamics. In *SPIE Conference on Visualization and Data Analysis (VDA)*, San Francisco, January 2012. 8 pages.

[13] **Nicolas Bouillot**, Marcio Tomiyoshi, and Jeremy R. Cooperstock. Extended user control over multichannel content delivered over the web. In *AES 44th Conference on Audio Networking*, San Diego, USA, November 2011. 5 pages.

[14] Adriana Olmos, Mathieu Brulé, **Nicolas Bouillot**, Mitchel Benovoy, Jeff Blum, Haijian Sun, Niels Windfeld Lund, and Jeremy R. Cooperstock. Exploring the role of latency and orchestra placement on the networked performance of a distributed opera. In *12th Annual International Workshop on Presence*, Los Angeles, November 2009. 9 pages.

[15] **Nicolas Bouillot**, Mathieu Brulé, and J.R. Cooperstock. Performance metrics for network audio systems: methodology and comparison. In *127th Audio Engineering Society convention*, New York, October 2009. 9 pages.

[16] Zack Settel, M. Wozniewski, **Nicolas Bouillot**, and Jeremy R. Cooperstock. Audio graffiti: A location based audio-tagging and remixing environment. In *International Computer Music Conference (ICMC)*, Montreal, August 2009. 4 pages.

[17] Romain Pellerin, **Nicolas Bouillot**, Tatiana Pietkiewicz, Mike Wozniewski, Zack Settel, Eric Gressier-Soudan, and Jeremy R. Cooperstock. Soundpark: Towards highly collaborative game support in a ubiquitous computing architecture. In Springer-Verlag Lecture Notes in Computer Science, editor, *9th IFIP international conference on Distributed Applications and Interoperable Systems (DAIS'09)*, Lisbon, Portugal, June 2009. 14 pages.

[18] **Nicolas Bouillot** and Jeremy R. Cooperstock. Challenges and performance of high-fidelity audio streaming for interactive performances. In *New Interfaces for Musical Expression (NIME'09)*, Pittsburgh, 2009. 6 pages.

[19] **Nicolas Bouillot**, Mike Wozniewski, Zack Settel, and Jeremy R. Cooperstock. A mobile wireless augmented guitar. In *8th International Conference on New Interfaces for Musical Expression (NIME'08)*, Genoa, Italy, June 2008. 4 pages.

[20] Mike Wozniewski, **Nicolas Bouillot**, Zack Settel, and Jeremy R. Cooperstock. Large-scale mobile audio environments for collaborative musical interaction. In *8th International Conference on New Interfaces for Musical Expression (NIME'08)*, Genoa, Italy, June 2008. 6 pages.

[21] Mike Wozniewski, **Nicolas Bouillot**, Zack Settel, and Jeremy R. Cooperstock. An augmented reality framework for wireless mobile performance. In *5th International Mobile Music Workshop*, Vienna, Austria, May 2008. 2 pages.

[22] **Nicolas Bouillot**. nJam user experiments: enabling remote musical interaction from milliseconds to seconds. In *New Interfaces for Musical Expression (NIME'07)*, New York, June 2007. 6 pages.

[23] **Nicolas Bouillot**. Fast event ordering and perceptive consistency in time sensitive distributed multiplayer games. In *7th International Conference on Computer Games (CGAMES'2005)*, Angoulême, France, November 2005. Q. Mehdi et N. Gough. 7 pages.

[24] Julien Cordry, **Nicolas Bouillot**, and Samia Bouzefrane. Performing real-time scheduling in an interactive audio-streaming application. In *ICEIS'05, International Conference on Enterprise Information Systems*, Miami, May 2005. 10 pages.

[25] Hans-Nikolas Locher, **Nicolas Bouillot**, Erwan Becquet, François Dechelle, and Eric Gressier-Soudan. Monitoring the distributed virtual orchestra with a CORBA based object oriented real-time data distribution service. In Springer-Verlag Lecture Notes in Computer Science, editor, *DOA'03, International Symposium on Distributed Object Application*, Catania, Italy, November 2003. 12 pages.

Book

[1] **Nicolas Bouillot**. *Cohérence et Applications Multimédia Interactives Distribuées: du concert réparti sur Internet aux jeux multi-joueurs en réseau.* Éditions universitaires européennes edition, 2010. ISBN: 978-6131511851. 220 pages.

Patent

[1] Luc Courchesne, Bruno Roy, Emmanuel Durand, Mike Wozniewski, and **Nicolas Bouillot**. Method, system and apparatus for capture-based immersive telepresence in virtual environment, March 2015. WO Patent App. PCT/CA2014/050,888.

Workshop

[1] Émile Ouellet-Delorme, Emmanuel Durand, Marie Ève Dumas, Michał Seta, **Nicolas Bouillot**, and Patrick Dupuis. Rapid prototyping of an immersive audiovisual installation. In *Immersion Expérience Symposium (iX), aires de jeux 360*, [SAT] Montréal, May 2019.

[2] **Nicolas Bouillot** and Michal Seta. Building distributed graph of live audio/video/data streaming with switcher/shmdata, puredata and your application. Linux Audio Conference, IEM, Graz, Austria, May 2013. (2 hours).

Conferences in French

[1] Romain Pellerin, **Nicolas Bouillot**, Tatiana Pietkiewicz, Mike Wozniewski, Zack Settel, and Eric Gressier-Soudan. Soundpark: Exploring ubiquitous computing through a mixed reality multi-player game experiment. In $9^{\grave{e}me}$ *Conférence Internationale sur les NOuvelles TEchnologies de la RÉpartition, (NOTERE'09)*, Montreal, Canada, July 2009. 7 pages.

[2] Julien Cordry, **Nicolas Bouillot**, and Samia Bouzefrane. Bossa et le concert virtuel réparti, intégration et paramétrage souple d'une politique d'ordonnancement spécifique pour une application multimédia distribuée. In *RTS'05, 13th International conference on Real time Systems*, Paris, April 2005. 26 pages.

[3] **Nicolas Bouillot**. Le modèle de cohérence perceptive pour les applications multimedia interactive et distribuées. In *CDUR'05, Journées Francophones sur la cohérence des Données en Univers Réparti*, Paris, November 2005. 6 pages.

[4] **Nicolas Bouillot**. Un algorithme d'auto synchronisation distribuée de flux audio dans le concert virtuel réparti. In *CFSE 3, Conférence Française sur les Systèmes d'Exploitation*, La Colle sur Loup, France, October 2003. 12 pages.

[5] **Nicolas Bouillot**. Une architecture pour le jeu musical réparti avec jMax et RTP. In *MAnifestation des JEunes Chercheurs en Sciences et Technologies de l'Information et de la Communication (MAJEC-STIC'03)*, Marseilles, France, October 2003. 6 pages.

Distinctions & Research Grants

2022-2023	"Hybrid, reproducible and sustainable Teleimmersion" Quebec Ministry of Economy and Innovation (MEI). With Emmanuel Durand, Christian Frisson, Alexandra Marin, Edu Meneses, Véronique Paradis, Thomas Piquet, Michał Seta, Zack Settel and Edith Viau.
2022-2023	"Multisensory augmentation of spaces for social immersion" Quebec Ministry of Economy and Innovation (MEI). With Emmanuel Durand, , Christian Frisson, Alexandra Marin, Edu Meneses, Véronique Paradis, Thomas Piquet, Michał Seta, Zack Settel et Edith Viau.
2019-2021	"Simulation of Volumetric Acoustics in VR/AR/MR (SAV+R)" Quebec Ministry of Economy and Innovation (MEI). With Emmanuel Durand.
2019-2021	"Simulation of Volumetric Acoustics in VR/AR/MR (SAV+R)" Quebec Ministry of Economy and Innovation (MEI). With Emmanuel Durand.
2019-2021	"Spontaneous, Adaptative and Collaborative Immersion (ICSA)" Quebec Ministry of Economy and Innovation (MEI). With Emmanuel Durand.
2017-2019	"Creation of tools and processes for the creation and in situ editing of interactive immersive spaces" Quebec Ministry of Economy, Science and Innovation (MESI). With Emmanuel Durand.
2009	selected among best papers at the 9th Conférence Internationale sur les NOuvelles TEchnologies de la RÉpartition (NOTERE'09)
2003	best paper at the MAnifestation des JEunes Chercheurs en Sciences et Technologies de l'Information et de la Communication (MAJEC-STIC'03)
2002–2005	merit schoolarship from French Ministry of Research and Technology (Ph.D.)
2001	merit schoolarship (Master2)

Scientific participation

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Review	Committee member of the conference on New Interface for Musical Expression, NIME (60 papers since 2009)
	International Society for Music Information Retrieval Conference, ISMIR (6 papers since 2020)
	NSERC College and Community Innovation Grant review (1 proposal since 2020)
	Meta reviewer of the conference on New Interface for Musical Expression, NIME (2015)
	Journal of the Audio Engineering Society (8 papers since 2012)
	IEEE Transaction on Multimedia (10 papers between 2005 & 2013)
	126th Convention of the Audio Engineering Society, 2009 (7 papers)
	French workshop on consistency issues in distributed systems, CDUR'09 (3 papers)
	5th Workshop on Network & System Support for Games, NETGAMES'06 (2 papers)
Org.	president of the CDUR'09 workshop program committee (Consistency issues in distributed systems)
	Ph.D. Students representative substitute for CNAM-CEDRIC (elected from 2003 to 2007)
	organization committee member for UBIMOB'06 (French conference on Ubiquity and Mobility)
	organization committee member for JTRES'06 (4th International Workshop on Java Technologies for Real-time and Embedded Systems)

Universities and School

The **Conservatoire National des Arts et Métiers** (CNAM) is a Public Scientific, Cultural and Professional Institution, classed as a grand établissement, among France's top higher education establishments. Supervised by the Minister for Higher Education, the Cnam has a triple role: providing life-long training, undertaking research in technology and innovation and disseminating a culture of science and technology.

Pierre & Marie Curie University (UPMC) is the largest universities teaching science and medicine in France, and indeed in Europe, with 4 000 researchers and teaching academics/researchers, 180 laboratories, and some 30 000 students including 8 000 in postgraduate studies.

The **École Nationale du Jeu et des Medias Interactifs Numériques** ENJMIN is a public institute based on a partnership with the CNAM, the Universities of La Rochelle and Poitiers, the regional Poitou-Charentes CNAM, the national comics and image Centre (CNBDI), and businesses in the audio-visual and telecommunication technology and games sectors. The universities and the CNAM ensure the accreditation for the Master programmes.

Teaching time line
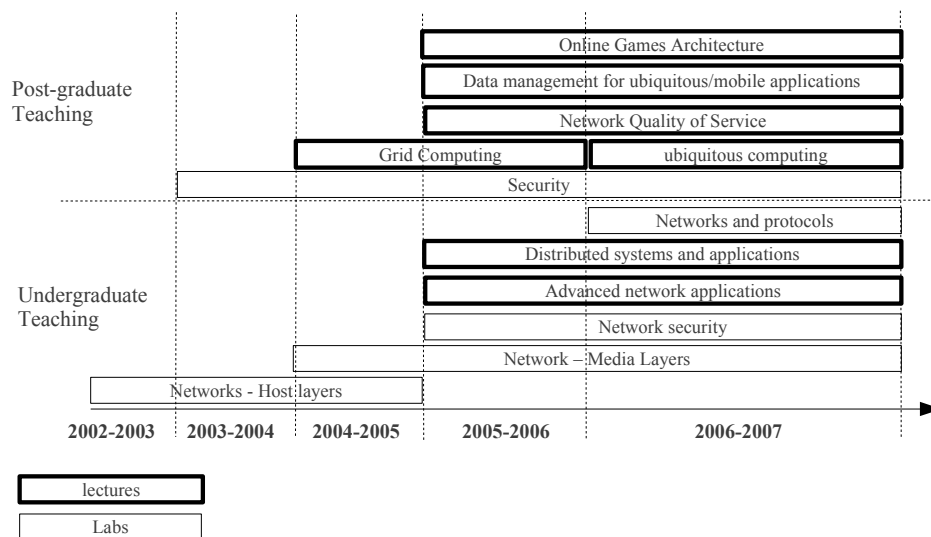
Supervised the Middleware/Ubiquitous Computing courses during the 2006-2007 year for the SAR Master2 (Distributed Systems and Applications) at the UPMC, including planning, introduction course, administrative task and exam. Wrote exams for the *Networks and Quality Of Service* and the *Grid Computing* courses.