Curriculum Vitæ

François Pachet
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Director, Spotify Creator Technology Research Lab
Founder, Flow Records

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French, 2 children

Professional Interests

My scientific interests concern computers and creativity. I investigate these issues by designing, building and experimenting with software systems. I was associate Professor at Université Pierre et Marie Curie (UPMC) until 1997 where I studied the integration of inference techniques (rules, constraints) in object-oriented languages for knowledge representation. In 1997, I set up a research team at SONY Computer Science Laboratories to focus on music listening and interaction and became director of Sony CSL in 2014. In 2012, thanks to an ERC Advanced Grant, I conducted the Flow-Machines project to explore style modeling and manipulation. This project led to the first produced pop songs composed with AI and the creation of the first music label dedicated to the professional use of AI for music production. I now head a 10-person research lab in Spotify, to design the next generation of AI-based tools for music creation, and the first music title orchestrated with Spotify AI was released in June 2019.

Positions

2017–	**Director**, Spotify - Creator Technology Research Lab (Paris), a research laboratory, created in 2017, dedicated to research in music creation with artificial intelligence
2014-2017	**Director,** SONY CSL (Computer Science Laboratories) Paris, a basic research laboratory created in 1996 dedicated to basic research in computer science
2014-2017	**Invited Professor**, Universidade Federal de Pernambuco, Recife (Brazil) through a "**Pesquisador Visitante Especial**" grant of CNPq, Science Without Borders Program, Brazil. This program aims to attract senior foreign researchers recognized internationally as leaders in their areas
2014-2015	**Professor**, **Goldsmiths College,** University of London (part-time)
2013	**Deputy Director,** SONY CSL
2005	**Senior Researcher** at SONY CSL. Author of over **120 publications** in journals and international conferences in the domains of Audio, Music, Multimedia

and Artificial Intelligence, including IJCAI, AAAI, Com. of ACM, IEEE Trans. on ASLP, JASA, ISMIR, and 3 monographs

1997	**Researcher** at SONY CSL, Paris. Creator of the music team (12 persons) with the mission to invent novel music listening and interaction technologies
	Author and co-author of **40 patents** filed by SONY Corporation (Europe and USA) on audio feature extraction, electronic music distribution and music interaction
1993-1997	**Assistant Professor (Maître de conférences)** in Computer Science at UPMC, LIP6, 1st class
	Author and co-author of several artificial intelligence systems, distributed by UPMC: *NéOpus* (inference engine in Smalltalk), *BackTalk* (combinatorial optimization with Pierre Roy), *MusES* (musical object library)
1992-1993	**Post-doctoral researcher** at Université du Québec à Montréal. Research on the *Cyc* project (common sense representation, Douglas Lenat, MCC) and its application to text generation, with Hafedh Mili
	Consultant with OTI (Object Technology International, now IBM Ottawa Software Lab), on rule-based systems
1991-1992	**ATER** (Temporary Research Assistant) at UPMC
1989-1991	**Moniteur** (teaching assistant) at UPMC
1987-1988	**Professor of Computer Science,** University of Kuala-Lumpur (Malaysia), during my military service (French cooperation). Master level courses in A.I.

Publications

- 5 monographies, 4 edited books, 22 book chapters, 50 high impact journal papers, 41 high impact conference papers), see this link
- 40 Granted patents for Sony Corporation
  - US6794566 (9/21/2004) Information type identification method and apparatus, e.g. for music file name content identification [**281 citations** by other patents].
  - US20080126937A1 (10/05/2004) Content management interface [**187 citations**]. Describes a user interface to access music by gesture.
  - US7034217B1 (4/25/2006) Automatic music continuation method and device [**29 citations** by other patents]. This patent describes the Continuator. This system pioneered the use of interactive machine learning for music improvisation.
  - US7624012 (11/24/2009) Function Pattern Generator [**34 citations** by other patents]. This patent describes audio feature generation. It was extended by over 10 patents in Japan, and the technology was transferred to Sony Corp. for many products (PS3, Hifi, digital cameras).
- **6 filed patents** for Spotify AB

Inventions

- **LSDB**, the first comprehensive database of lead sheets in many styles (pop, jazz, Brazilian music), designed to feed machine-learning score generators. Currently the largest collection of lead sheets in electronic format (over 14,000)
- **ReflexiveLooper** (with M. Marchini), a system that learns in real time the style of a musician and generates automatically lead sheet based accompaniments. Semi-finalist of the Guthman Instrument Competition, Atlanta. CHI 2013 best paper award.
- **FlowComposer** (with P. Roy), a system to compose lead sheets in the style of arbitrary composers, used for composing a Pop album, and for the musical "Beyond the Fence",

premiered in the Arts Theatre, London, February 2016 (prod. by Sky Arts / Wingspan). *"It's truly impressive"* said jazz guitarist Pat Metheny, *commenting on a track programmed by Pachet's team (The Atlantic, Aug. 2014).*

- **ReChord** (with M. Ramona), a system to record audio for style capture and generation of audio accompaniments
- **Virtuoso**, a jazz solo generator in my style
- **EDS**, the first audio feature generation system (technology transferred to SONY Corp.),
- **MusicBrowser**, the first content-based music access system, with extraction of musical descriptors from the audio signal
- **Continuator**, an interactive music improvisation system. Experimented with many professional musicians. Presented notably at the SIGGRAPH'03 conference and considered a reference in the domain of music interaction
- **MusicSpace** (with O. Delerue), a spatialization control system

Invited Talks

Over 100 invited talks and keynote speeches, including: **Tedx** ISTAlameda, **Kikk** festival, European Commission **FET** seminar; **EPIA** 2015; **ICML** 2015 (International Conference on Machine Learning) **CML** workshop; Workshop on Cultural & Social Analytics, Imperial College; Colloquium Jacques Morgenstern, Inria Sophia Antipolis; ArsMusica, Brussels; CSL Open House at MOMA, NY, etc.

I created the tutorial series *"Why X is interesting"*, and delivered it for Jazz, Brazilian guitar and studio production. Since 2012 it was given 7 times at the ISMIR conference on various topics (Hip-hop, Greek music, flamenco, singing).

Education

2006   **Auditor** of the 58th national session of Institut des Hautes Etudes en Défense Nationale (IHEDN). Appointed by Prime Minister.
        Colonel in the "réserve citoyenne" (French Air Force) since Sept. 2007
1997   **Research Advisor Diploma** (Habilitation), UPMC. Thesis on: « Object-oriented languages and knowledge representation» supervisor: **J.-F. Perrot**
1992   **Ph.D.** UPMC, in Computer Science. Thesis: « Knowledge representation with objects and rules: the NéOpus system», supervisor: **J.-F. Perrot**
1987   **Master** (DEA) IARFAG (Artificial Intelligence), UPMC, with **J.-L. Laurière**, internship at IRCAM with **David Wessel** (U. California Berkeley)
1987   **Civil Engineer,** Ecole Nationale des **Ponts & Chaussées**. Major in Applied Mathematics

Committee Memberships

- **General chair** of the **ICCC 2018** conference, Salamanca (Spain)
- **Co-organizer** of the **Constructive Machine Learning (CML) workshops at NIPS 2016**
- **Advisory Board member** of the FastImpact project (Mark Sandler, Queen Mary, U. London, a 5.2M£ EPSRC Programme grant)
- **Advisory Board member** to the European Research Area chair of Falmouth University (Simon Colton, 2.4M£)
- **Advisory Board member** to the ERCComics project about dissemination of ERC projects with web comics (Fiammetta Ghedini, 800k€)
- **Creator and editor** of the **Springer book series** "Computational Synthesis and Creative Systems"

- **Member of the ICCC steering committee**
- **Program chair** of the **ICCC 2016** conference held in UPMC, Paris, June 2016 (100 attendants)
- **Co-chair** of the **AI & Arts track** at **IJCAI 2015**, Buenos Aires, Argentina
- **Associate editor/editorial board**, ACM Computers in Entertainment; Journal of Music and Meaning
- **Expert** at the European Commission for the evaluation and review of projects in the IST programmes and for consultations (Creativity Unit, FET, FP6/7, E-content)
- **Member** of over 60 PhD defense committees (MIT, UPMC, Ircam, etc.)

Grants

Over 3.7 M€ in external funding in the last 10 years, including:

- **ERC Proof of Concept Grant** for the **FlowMachines** project, started March 2015
- **ERC Advanced Grant** for the **FlowMachines** project, started August 2012
- Co-PI of 5 European collaborative projects: **Lrn2Cre8**, **Praise** ("excellent" by the E.C), **Miror** (FP7, ranked 1st in its category), **Semantic-Hifi**, **Cuidado** (FP6)
- Co-PI of ARC-funded (Australian Research Council) project **"Improvisational interfaces: Inspiring new forms of human-computer creativity"** headed by Jon McCormack (Monash University, Australia), started 2016

Fellowships, awards

2017	**Doctor Honoris Causa**, University Federal do Pernambuco, Recife, Brazil.
2016	AAAI 2016 **Best video award** for the reorchestration of European Anthem "Ode to Joy" (with F. Ghedini)
2015	**SONY Certificate of Appreciation** "in recognition for excellent technology and experience in the successful development of the extraordinary EDS and ELFE machine learning algorithms that has contributed outstandingly towards the Production Center in accomplishing the automation of functional inspection processes"
2014	Elected Fellow of EurAI (European AI society) for "significant, sustained contributions to the field of artificial intelligence"
2014-2017	Invited Researcher, Universidade Federal de Pernambuco, Recife (Brazil) through a "**Pesquisador Visitante Especial**" grant of CNPq, Science Without Borders Program, Brazil. This program aims to attract senior foreign researchers recognized internationally as leaders in their areas
2013	IJCAI 2013 and AAAI 2013 **Best video award** (with F. Ghedini)
2012	CHI 2013 **Best paper honorable mention award**
2014-2015	Professor, **Goldsmiths College,** University of London
2007	Appointed **Chevalier des Arts et des Lettres**
2002	**Best Paper Award**, International Computer Music Conference
2000	**Best Software Prize,** Bourges music software competition (with O. Delerue)
1995-1997	**Doctoral supervision** fellowship, Ministry of National Education
1994-1995	Invited Professor, **Université de Montréal,** Mathematics and Operation Research Department
1992	**INRIA Post-doc fellowship**, Université du Québec à Montréal (Prof. H. Mili).
1991-1992	Research scholarship (ATER) at Laforia/Lip6 laboratory, UPMC
1989-1991	Teaching **scholarship** (Monitorat, UPMC)

Media

About [150 media and press appearances](#) (Wall Street Journal, Vanity Fair, Forbes, TechCrunch, Playboy, New York Times, Canal+, Europe 1, Sky Arts, ARTE, the Atlantic, BBC, leMonde, Vpro, La Recherche, Radio Canada, etc.).
I was portrayed as one of the "50 most influential French people in the world" in Vanity Fair, December 2017.

Supervision of Graduate Students and postdoctoral Fellows

Ph.D. (13): Pierre Roy (1995-1998, UPMC), Olivier Delerue (1998-2002, UPMC/Ircam), Anne Liret (1997-2000, UPMC), Jean Carrive (1997-2000, UPMC), Aymeric Zils (2001-2004), Jean-Julien Aucouturier (2003-2006, UPMC), Giordano Cabral (2004-2007, UPMC), Tristan Jehan (2004-2005, MIT Media Lab), Sergio Krakowski (2006-2009, IMPA, Brazil), Gabriele Barbieri (2010-2013, University Bologna), Gaëtan Hadjeres (2014-2017, Ecole Polytechnique), Stéphane Rivaud (2016-, U. of Reims), Théis Bazin (2017-2018, UPMC).

Post-docs (7): Alexandre Papadopoulos (2012-2017, UPMC), Fiammetta Ghedini (2012-2014, Sony CSL), Marco Marchini (2014-2017, UPMC), Jason Sakellariou (2013-2017, UPMC), Stan Gorlow (2015-2016, Sony CSL), Simon Mouliéras (2015-2016, Sony CSL), Mathieu Ramona (2014-2017, Sony CSL).

I participated in 66 Ph.D. defense committees (MIT MediaLab, U. of Paris, Bordeaux, Edinburgh, etc.).

Miscellaneous

IMPACT FACTORS: [H-index = 48](#), G-index = **90**, as of Dec. 2020 (google scholar)

LANGUAGES

French	Native
English	Fluent, 640/660 at TOEFL. Working language.
Russian	Institut des Langues Orientales (2 first years of DULCO). Courses at Institute Goubkina, Moscow (1987, fellowship from Ministry of foreign affairs)

MUSIC	Semi-professional activity as composer and performer (jazz guitar). Member of SACEM, the French society of music composers. Founder and CEO of **Flow Records**, the first music label dedicated to AI-composed music.

2019	Development of **Spotify AI** technology used in the EP "[American Folk Songs](#)" (Benoît Carré), launched Sept. 2019
2018	Production of the first AI-composed album "[Hello World](#)" (Benoît Carré, featuring Stromae, Kiesza, etc.), launched Jan. 2018 (11M streams)
2017	Private courses with jazz virtuoso guitarist **Claude Barthélémy**
2016	Production with B. Carré of a song in the style of the Beatles using Flow Composer (*Daddy's car*, 2M views on YouTube) and of the first AI-composed Pop multi-artist concert (Gaité Lyrique, October 27th)
2015	Production of a [re-orchestration of Beethoven's "Ode to Joy" (European anthem)](#) in 7 styles using Flow Machines, and demonstrated at the European Parliament for the 5000th ERC grantee ceremony

2014	Co-composer and performer of jazz album "Count on it" with **Mark d'Inverno**, launched Nov 1st 2014 at Pizza Express Jazz Club Soho, London, with **Gilad Atzmon** as special guest (sold out concert)
2014	Author or co-author of 3 music tutorials on jazz, on Brazilian guitar (with G. Cabral), and audio production presented in conferences (ISMIR) and Brasilia conservatory
2014	Composer and performer of Pop music album "Marie-Claire" with **J.-C. Urbain** (*les Innocents*) and **C. Diran** (*Lilicub*)
2013	Obtained the "Paris metro" license from RATP (Paris Transportation Public Company), the official authorization to play music in the Paris metro
2011	IJCAI reception jazz concert with Mark d'Inverno Quintet (Poble Espanol)
2009	Courses with jazz guitarist **Michel Perez**
2000-2002	I introduced the use of interactive AI in *festival d'Uzeste*, with performances with Continuator with **Bernard Lubat** and **György Kurtág Jr**
1996-1998	3 first years, music writing course of **Jean-Michel Bardez** (baroque harmony, counterpoint) at Conservatory of the X^e arrondissement in Paris
1981	Summer session at **Berklee** College of Music, Boston. Courses in harmony, arranging, guitar
1978-1981	**Classical guitar**, Ecole Normale de Musique de Paris with **Roland Dyens**

LITERATURE

2018	Histoire d'une oreille, Buchet-Chastel, 2018. The first augmented book using Spotify codes, about the story of a musical ear.
2018	Max Order ou l'invention du style (co-author). Graphic novel realized in the context of the ERCcOMICS project.
2008	Comment je n'ai pas rencontré Paul McCartney, publie.net, edited by François Bon.