

# Lilian Besson | Curriculum Vitæ

PhD student, "normalien" from ENS Cachan, and teacher in Maths and Computer Science

Adress: 23, boulevard Jeanne d'Arc – 35000 Rennes, France

☎ +33 6 28 41 22 57 • ✉ Lilian.BESSON@CentraleSupélec.fr

📁 perso.crans.org/besson • 🌐 Naareen • 📁 bitbucket.org/lbesson

## Personal information

**Date of birth:** January 12, 1993 at *Briançon*, Hautes-Alpes, France. **Age:** 25. **Citizenship:** French.

### Teaching experience.....

#### (1) Lycée Lakanal

Sceaux, France

TA in Mathematics and Computer Science in a prep' school (MP) (106h/year)

Sept. 2015 – June 2016

#### (2) Mahindra École Centrale

(Hyderabad, India)

Teaching Assistant at full time (250h/year)

July 2014 – May 2015

○ Lectures, tutorials and practical sessions as a TA, for Mathematics (MA101,102) and for Computer Science (CS101) for two semesters, and helped a lot on various aspect for the first academic year at the very new MEC engineering college.

### Programming and development skills.....

- **Very regular use:** Python (*scripting and OOP*), GNU Bash (*scripting*), OCaml (*functional language*).
- **Regular use:** HTML & CSS, JavaScript (*for the web*), Matlab & GNU Octave (*sequential computation*), C.
- **Basic knowledge:** Maple, Assembly (Intel x86, TI-83+), nVidia CUDA (*parallel computation on GPU*), BASICS.
- **Documenting programming projects:** Used to OCamlDoc for OCaml, PyDOC and Sphinx for Python.

### Computer skills.....

- **Operating Systems:** fluent with all (Microsoft Windows, Mac OS X, Android, and mainly GNU/Linux).
- **Text edition:** frequent use (and occasional hacks) of Gedit, GNU Nano, Spyder and SublimeText.
- **Text processing:** advanced use of L<sup>A</sup>T<sub>E</sub>X and Beamer, and also of reStructuredText and Markdown.

### More about myself.....

Passionate about new technologies and programming. Active on GitHub and Bitbucket (Git), and Wikipédia.

Good theoretical and practical background in maths and computer science, +2 level in physics and chemistry.

- **Language:** French: native (mother tongue), English: fluent (Speaking and writing. TOEIC got in April 2012, with the mark 900/990). Spanish: medium level. Japanese: early beginner.
- **Health:** Perfect health clearance (all required vaccines, including some exotic ones). I wear glasses.
- **Sports:** Occasional practice of trek, mountain bike, kick scooter, swimming, badminton.
- **Acting:** Theater and clown lessons, for 6 years (2003 – 2009).
- **Hobbies:** Painting, RPGs, theater and cinema, video games, fantasy literature, hitch-hiking and traveling.
- **Traveling:** to Spain, Germany, Sweden, Iceland, UK, Ireland, USA, Canada, Switzerland, India. . .

### Reference contacts.....

#### Professors from ÉNS Cachan

- Gabriel Peyré (Dauphine)
- Nicolas Vayatis (CMLA)
- Claudine Picaronny (LSV)
- Hubert Comon (LSV)

#### Former internship tutors

- Michael Unser (EPFL)
- Julien Fageot (EPFL)
- Jules Villard (ICL)
- Florian de Vuyst (CMLA)

#### Recent employers

- Lycée Lakanal (15/16)
- École Centrale of Paris (14/15)
- Mahindra École Centrale (15/16)
- ENS de Cachan (2011/16)

**Detailed academic education**

(2009 – 2016)

(Currently) 2<sup>nd</sup>-year research M.Sc. (Sept. 2015 – August 2016).....**ÉNS de Cachan (4<sup>th</sup>-year student, normalien) & Université Paris Saclay***MVA: 2<sup>nd</sup>-year of Master of Science in applied maths (machine learning, numerical optimization) Rank: 1<sup>st</sup>, avg: 18.4/20*

- 1<sup>st</sup> sem.: Graphs ML, Convex Opt. Reinforcement and Stat. Learning, PGM, Compressed Sensing (Avg: 18.25/20).
- 2<sup>nd</sup> sem.: Kernel Methods, Neuro-Science, High-Dim. Stats, Sequential Learning, Brain Imaging (Avg: 17.68/20).
- May 2016: *Machine Learning Summer School* (MLSS'2016), at Cadiz (Spain), for a poster: lbo.k.vu/MLSS2016.

2<sup>nd</sup>-year M.Sc. and a teaching training (Sept. 2013 – July 2014).....**ÉNS de Cachan (3<sup>rd</sup>-year student, normalien)***M.Sc. major in Maths, minor in Computer Science**Ranked 3<sup>rd</sup>/26, summa cum laude*Received at the French national competitive exam for prep' schools teachers (*agrégation*), ranked 23<sup>rd</sup> over 795.1<sup>st</sup>-year M.Sc. (Master of Science) (Sept. 2012 – August 2013).....**ÉNS de Cachan & Paris Diderot University (Paris VII)***1<sup>st</sup>-year M.Sc., in Computer Science**Mark 15.25/20, magna cum lauda*

Functional programming and typing, cryptographic protocols, compilation, Markov chains and random algorithms, net programming, machine learning.

*1<sup>st</sup>-year M.Sc., in Mathematics**Mark 14.4/20, magna cum lauda*Complex analysis, functional analysis, numerical optimization, exterior calculus, *PDE* approximation.3<sup>rd</sup>-year B.Sc. (Bachelor, French "licence") (Sept. 2011 – July 2012).....**ÉNS de Cachan & Paris Diderot University (Paris VII)***B.Sc., in Computer Science**Mark 14.27/20, magna cum lauda*Logic, semantics, cryptography, algorithmic, graph theory,  $\lambda$ -calculus, compilation, parallel computation.*B.Sc., in Mathematics**Mark 14.7/20, magna cum lauda*Functional analysis, differential geometry, integration, algebra, arithmetic, partial differential equations (*PDE*).2<sup>nd</sup>-year B.Sc. (Sept. 2010 – August 2011).....**Lycée Thiers****Marseille***"Classe préparatoire", 2<sup>nd</sup> year**Ranked 1<sup>st</sup>/33 & mark 17.9/20*

Second year, "MP\*" : maths, chemistry, physics, engineering, computer science, literature, English and Spanish.

**"Grandes Écoles" entrance exams**.....○ **ÉNS de Cachan ("École Normale Supérieure")****Cachan**○ *Accepted, and matriculated (with the special French status "élève normalien"), ranked 99<sup>th</sup>/1200**July 2011*

Student at the maths department, with a government-funded 4-years scholarship since Sept. 2011.

○ **École polytechnique****Paris**○ *Accepted, ranked 81<sup>th</sup>/1900**July 2011*○ **All the 5 École Centrale, Supélec, SupOptique****Paris, Lyon, Marseille, Nantes, Lille**○ *Accepted, ranked 7<sup>th</sup>/2700**August 2011*1<sup>st</sup>-year B.Sc. (Sept. 2009 – July 2010).....**Lycée Thiers****Marseille***"Classe préparatoire"**ranked 1<sup>st</sup>/46 & mark 17.3/20*

First year, "MPSI" : maths, chemistry, physics, engineering, philosophy, literature, English and Spanish.

○ **École des Mines of Alès****Alès**○ *Accepted, Ranked 19<sup>th</sup>/3000 & mark 18.2/20**July 2010*

Other French national diplomas.....

○ **C2I2E**: French "Informatics and Internet Certificate for Superior Studies", level 2, obtained in July 2014.○ **Driving licence**: French driving licence for cars ("Permis B") in February 2012, and international in February 2014.

- **High-school certificate (French scientific “Baccalauréat”)**: obtained with the average mark 15.7/20, *magna cum laude*, in July 2009, at “Lycée d’Altitude” at Briançon (*major* in mathematics, *minor* in theater).
- **Diplôme national du Brevet**: obtained with the average mark 18.7/20, *summa cum laude*, in July 2006, at “Collège Les Garcins” at Briançon (*languages*: English and Spanish).

## 2<sup>nd</sup> M.Sc. research internship and Master thesis

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**Title:** “A theoretical study of steerable homogeneous convolutions, and applications to sparse stochastic processes”

**Supervisor:** Pr.Dr. Michael Unser and Julien Fageot. **Graded:** 19/20.

**Description:** Mathematics research internship at BIG Team at EPFL (Lausanne, Switzerland), April – August 2016.

**Master thesis:** On my web page, my internship report and the slides in English : <https://goo.gl/xPzw4A>.

## 1<sup>st</sup> M.Sc. research internship

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**Title:** “Towards modularity for planning and robot programs verification”

**Supervisor:** Dr. Jules Villard and Prof. Peter O’Hearn. **Graded:** 17.5/20.

**Description:** Computer Science research internship at UCL (at London), June – August 2013.

**Abstract:** General study of classic AI method to represent dynamic worlds (situation calculus and STRIPS), 3 main problems: frame, ramification and qualification problems. Need for modularity and compositionality, focused on the GOLOG language for robot programs, and Liu’s proof system.

**Master thesis:** On my web page, the internship report in English and the slides in French.

## B.Sc. research internship and Bachelor thesis

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**Title:** “Finite volumes method on nVidia graphic cards, applied to solve the compressible Euler problem”

**Supervisor:** Prof. Florian de Vuyst and Dr. Daniel Chauveheid. **Graded:** 17/20.

**Description:** Research internship in mathematics at CMLA (“Centre des mathématiques et de leurs applications”, ÉNS de Cachan maths. lab research), February – July 2012.

**Abstract:** General study of numerical solvers for differential equations and partial differential equations. Linear solver, first and second order, 1D, 2D and 3D, with the VFFC method. Numerical simulation, sequential using C and VTK, and parallel using nVidia CUDA. Interactive 2D simulation with OpenGL.

**Research report:** My bachelor thesis, in French on my website: <http://besson.k.vu/rapportL3Maths12.pdf>.

## Other research and programming experiences

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Current programming projects.....

- **Personal web site** (<http://besson.k.vu/>): an experimental, responsive, lightweight and standards-respectful website, powered by Sphinx. Stores my resume, all my projects, and tutorials on web-design and programming.

M.Sc. programming projects (2012 – 2013).....

- **ANSIColors**: a Python script and module to easily use colors in a terminal on GNU/Linux, on Pypi.
- **Bombberman**: a Python-powered multi-player Bomberman game with formal semantics (MPRI net lecture 1.21).
- **Machine Learning**: a Python-powered Kaggle project, about Titanic survivors.

B.Sc. programming projects (2011 – 2012).....

- **ZenityOCaml**: an OCaml binding for the Debian-based Zenity project (a tool to display GTK<sup>+</sup> dialog boxes).
- **Tetravex**: implementation of a “Tetravex” game in OCaml (interactive programming and algorithmic work).

2<sup>nd</sup>-year B.Sc. research and programming project (2010 – 2011).....

**Title:** “Tropical Algebras et Linear Systems applied to Mobility problems”

**Supervisors:** Prof. Agnès Borel (Lycée Thiers) and Prof. Glenn Merlet (Aix-Marseille I University)

**Abstract:** General study of tropical algebras, time processes (Petri nets and Markov chains).

Dijkstra algorithm, both *tropical* and time dependent versions, implemented with Maple 12.