

# ARTHUR MILCHIOR

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Researcher and computer programmer.

During six years in academia, I created algorithms and programs to solve complex mathematical problems. In the last two years, I also contributed to a free-software ecosystem, Anki, where my programs were downloaded tens of thousands of times. This gave me experience in interacting with users and other developers. I am looking forward to using my theoretical knowledge and my programming skills to create software and to help solve problems.

Being a U.S. citizen, I can immediately work in the U.S.

## EDUCATION

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<b>Université Paris-Diderot, IRIF</b> Ph. D. of Computer Science	<i>2012–2016</i>
<b>École normale supérieure of Paris</b> Master's degree, major in Computer Science, minor in Mathematics	<i>2008–2012</i>
<b>Université Pierre et Marie Curie</b> Licence (Bachelor's degree) in Mathematics	<i>2011</i>

## FREE SOFTWARE CONTRIBUTION

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**Anki (Python, JQuery, Java, Android)** *Since 2017*

I am a member of the Anki (and Ankidroid) community. Anki is a long-term learning assistant. My main contribution consists in dozens of add-ons, which have been collectively downloaded more than thirty thousand times. Some of those add-ons changed the interfaces displayed to the users. Others improved the efficiency of the program, for instance via caching some data and avoiding costly recomputations. I ported features from the desktop version to the Android version.

I have also made bugfixing pull requests which have been integrated into desktop and Android code. I wrote documentation that covered crucial parts of the program - both its code and its usage as a software- allowing power-users to improve their usage of Anki. I am currently developing a fork (<https://github.com/Arthur-Milchior/anki>) of this program in order to natively add many features.

## EMPLOYEMENT

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**Research in Computer science at Université Libre de Bruxelles** *2017–2019*

I discovered the field of model checking and I joined the MightyL team. We developed an algorithm which allows to decide efficiently whether a logical Metric Interval Temporal Logic (MITL) formula is satisfiable or not. I became the maintainer of this program (written in OCaml), created by the previous post-doc. Eventually, I rewrote this program in order to make it more modular and thus easier to update.

**ATER (Lecturer) at Université Paris-Est Créteil** *2016–2017*

Teaching introduction to programming and networks to students.

**Ph. D. at University Paris-Diderot (IRIF)** *2012–2016*

My Ph. D. considered different ways to encode set of vector of numbers. In particular, I studied sets

which can be defined using a “weak arithmetic”. During the first half of the Ph. D. I have proven that most natural extensions of this arithmetic lead to undecidability results for many problems.

During the second half of the Ph. D., I considered digit-reading automata, which is a standard and efficient way to represent some set of vectors. While those notions are theoretically well-known, most problems remain algorithmically complex. I searched for efficient ways to determine whether the set accepted by an automaton is definable in some of those weak arithmetics. I created an algorithm, and implemented it (in OCaml), which solves this problem in linear time.

In this period, I was a teacher assistant in different courses about fundamental computer science and first and second year programming courses.

## TECHNICAL STRENGTHS

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- **Language:** French (native) and English (Fluent). Notions of Spanish and of German.
- **Citizenship:** France, U.S.A.
- **Programming:** Python, OCaml, SQL.  
Notions of C, Scheme, Haskell, Java, HTML/CSS, JS(JQuery).
- **Tools:** Git, emacs, L<sup>A</sup>T<sub>E</sub>X, Linux, Unix environments such as grep, sed, make.
- **Theory** Algorithms and complexity, data structures, relational databases, formal specification.
- **Miscellaneous:** Driving license, Red Cross first-help formation.

## EXTRA-CURRICULAR

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### Volunteering

*2012–2017*

I volunteered in an association which went to schools, discussing LGBTphobia and sexism with high-schoolers. We also offered formations to adults about those subjects. This led me to create a (French) documentary, illustrating those discussions.

### Music

*Since 2002*

Mostly piano, guitar and ocarina

### Science popularization

*Since 2017*

I was a regular member of the French podcast *Trajectoires*, whose goal was to popularize math. I was also invited to speak twice in *Podcast Science* where I spoke of fundamental computer science. I participated to a science popularization program for High-School students.