

Arthur Reutenauer

Arthur Reutenauer is the president of Groupe francophone des utilisateurs de \TeX (GUTenberg) and is active in other aspects of \TeX use and development.

[Interview completed 3 March 2009.]



Dave Walden, interviewer: Please tell me a bit about your personal history independent of \TeX .

Arthur Reutenauer, interviewee: I'm the eldest of six children (and a seventh one is on the way). We have different sets of parents, but to simplify, let's just say that the first five of us have the same mother, and that we all grew up together in Southern France. The youngest child is my half-brother from my father's side, who has been living in Montréal for over 20 years. The seventh one will be a girl, also from my father. I should probably also mention that I have been born in Paris. We moved to the French Riviera when I was five, and, at that time, 2 1/2 children.

Although it might not be obvious at first, my family is actually deeply rooted in Alsace, the part of France bordering Germany on the Rhine, that has had such an unfortunate fate in history. Apart from my father in Canada and my mother on the Riviera, the vast majority of my relatives live there, in different parts of the region. Some also live in Germany, where one of my grandmothers comes from (initially in Torgau in Saxony, on the Elbe River). Thinking back about it, I think that having my origins in this very special region, and the fact that I never lived in it, had a deep influence on my development.

DW: In what way?

AR: Through my German grandmother (my father's mother), I was introduced to an alternate history I would never have learned at school. I learned the dark side of it, which somehow she took as natural, though in a non-fatalistic way. The most gruesome anecdote that happened in my family's history was when, ten days after the end of the war in Europe, her father was killed by a party of Red Army soldiers looting in the city (we were in the part of Germany that the Soviet Union took over; in fact, Torgau is supposed to be the city where the U.S. and Soviet armies joined, even if they actually joined somewhere in the outskirts). That's where my family's "little" history encountered the "great" history.

But back to my own past: the place where I grew up was a small village in Provence and we had a nice house with a few dozen olive trees, which my parents learnt how to take care of (my mother also grew up in the countryside in Alsace). But they were by far no agriculturers: all "three of them" (mother, father and stepfather) were math teachers, so I was kind of predestined :-). In fact, while we don't have the concept of suburb in France like you have in North America, this was probably the closest thing to a suburb: a small neighbourhood next to the big cities on the coast, and we had access to rather fancy schools.

I went to some of them: first, four years in a mixed primary-secondary school where

we had intensive music education (I took piano, cello, and singing lessons). We got to travel a lot, including on a few tours abroad. The farthest I went thanks to that school was Opole in southern Poland, when I was 10. Then five years at a school with intensive language courses, where I had the great opportunity to learn a couple of different languages: first, obviously German because of my family's origins, then English, Arabic, and finally Chinese. The latter started as a joke with my mother: at the beginning of high school, the school administration wished to encourage the study of "rare" languages by paying the fees of the reputed distance-learning organization. If I remember correctly, the interested students had the choice between Ancient Greek, Portuguese and Mandarin Chinese. Now, for some reason, at that time I wanted to learn Ancient Greek for a long time, but on that evening, my mother and I decided that I would give a try to Chinese instead, as a sort of bet. This would probably have been my last chance of learning dead languages, but I definitely chose for the living ones.

That was probably all for the best, since, thanks to my parents, we got to travel a lot. They took us all over Europe, and to America (where one of my mother's big brothers lived for a long time, in Boston). We crossed the U.S. from east to west, twice. During a trip to Scandinavia, we even pushed as far as Saint-Petersburg (not the city in Florida ;-)) — we went there on our second American trip). I was 12 then and was fascinated by what I saw during the few days we spent there. My stepfather, who had been learning Russian, taught me the Cyrillic alphabet and I tried to read the signs on the street. But some things seemed really odd to me. I just couldn't make heads or tails out of it, and I couldn't pin down what it was. Only many years later did I realize that I had been witnessing, with my Westerner child's eyes, what Russia looked like a few months after the breakup of the USSR.

DW: This is all fascinating. What a special, and educational, childhood. How did your formal education continue?

AR: When it comes to higher education in France, it really seems like you have only one golden path for scientific studies, which is the dreaded "classes préparatoires" (let's use preparatory schools as a translation). It's that kind of crazy place where you have to study like an animal in order to take competitive exams which give you access to a row of very reputed schools. The pressure is often intense. But I was really brilliant at math, I just loved it; and I was confident enough that I would do well.

I went to Paris — since, obviously, the most reputed places were in Paris. I took the exams two years in a row, and succeeded the second time. It gave me access to all the schools I wanted, and I chose the "École normale supérieure", a school destined to train students to work in research and higher education (although when it was founded, during the French Revolution, it was meant for secondary education). At that time I was really into math, and started liking physics. So, it was the deal: I was going to be a researcher in math. Or maybe physics. Or . . .

There were a couple of indecisive years, but in some way I had earned them. They really got me further than anything I could have imagined. You see, one of the unusual things at the École normale, like at a few other schools where you can go in by taking the exam after the classes préparatoires, is that you're actually paid for making your studies. It's not a bursary, you're really paid as a training civil servant during four years. I was of course to take advantage of that.

I started to go on a series of trips. To Italy. To China, with my family. To Italy, again. To China, again, through Russia on the Trans-Siberian railway. And over Mongolia on the way, since a bunch of corrupt Russian officers threw me, again with dozens of other

foreigners, out of the train; but, together with a handful of other young people, we found our way out. It was 2002, and the pretext for me to go to China was that the International Congress of Mathematicians took place in Peking that year. I say “pretext” because, obviously, I would have found other pretexts otherwise.

At that point, the school administration decided that my results weren’t that satisfactory, and cut me off the funds for one year. I had to take a couple of exams again, which I soon went through with, and by the end of the first semester I was ready to be on the road again. To China, obviously! Through Russia again, and this time I could stay on the train until the destination I had chosen. I made a round trip to Japan where one of my cousins celebrated her marriage, and came back to China, where I stayed three months. This was the moment of the SARS outbreak and, though a bit frightened at first, I decided to stay and to take advantage of my long holiday as soon as I could. After a few weeks I started to travel a lot around the country, and I could, in particular, see the Great Dam on the Yang-Tse river two weeks after they had completed the first part of the work, and flooded the area (the water went up to 135 meters above the reference level, if I remember correctly). The final phase of the construction should be completed this year, 2009. After my visa expired in China I went to Australia, which was the summer destination of my family this year. We went on a huge tour around the continent down under, and on the way back I made a stopover, to my great joy, in Taiwan (but I didn’t get to see much more than the insides of the international airport).

That big trip lasted a bit over six months, and I could resume my studies (and my funding) happily after that. I graduated in 2005 with the “agrégation” in mathematics, another competitive exam that allow the successful candidates to teach at secondary school.

I did that for one year. It wasn’t such a positive experience, and I wouldn’t like to get into details about it. Let’s just say that I wasn’t enough prepared for what teaching a class of teenagers would be, and I didn’t succeed very well. After the first year, I decided to take a break to think about my career path a bit more.

DW: And what happened?

AR: I had a couple of rough years where I had no job and no clear direction where to go. At one point I resumed my studies, in Brest and in CS this time, in the hope to start a Ph.D., but this led nowhere either. Very recently I have been offered a position at a startup in Paris, whose founder is a mathematician who wanted to develop a product based on algorithms he discovered for organizing databases. He was looking for a mathematician with a working knowledge of programming to work with him, and I had a contact with him through a colleague of my father. I thus came, by complete chance, to come back to my beloved natal town and to work in a great and inspiring environment. Since we have no office yet, I work at my boss’ home, and often at my home, too; my boss is happy with that.

One of the other coincidences is that the algorithms on which our product relies make heavy use of radix trees, that is . . . tries, like in \TeX ’s hyphenation patterns!

DW: How and when did you first get introduced to \TeX ?

AR: I was introduced to \TeX by my stepfather during my first year in classe préparatoire, in the spring of 1998. As I mentioned, those were years of intense studies, and we hardly had time to do all the assignments that we were given, but on top of that we were supposed to make a bit of “research work” about a not-so-original subject. There was some general theme (“approximation”, I think), and my father suggested to me continued fractions, which I really enjoyed. Thus, I set to write a report about it, and

started learning \LaTeX . I was immediately fascinated with what the output looked like and spent hours polishing it—which in retrospect was rather vain, as I had almost no knowledge at all; the only book I had was Lamport's, and my stepfather assisted me with some instructions. I remember my mother sounding really desperate that on top of all what I had to do, I stayed up half the night going over and over my DVI file, and—to tell the truth—I'd rather not see the source now! Of course it's long gone (I had several backups, but all of them must have gone down the drain). Thanks to my father, I still have a printed copy of the final report, that I, somewhat narcissistically, dated to my 18th birthday, at the end of that spring.

DW: Please tell me a bit about your use of \TeX in the years since then.

AR: My first uses of \TeX were, of course, related to my math studies. At the *École normale*, the first-year students in math were actually required to write one of their reports in \LaTeX , which suited me well, since I was already familiar with it. I also remember helping my father to type the text of one of his lessons during that period. A few years later, as a math teacher, I wrote all my assignments with $X_{\text{Y}}\TeX$ and the Baskerville font for text (math was in Computer Modern). This gave me some reputation among my students who were apparently used to the all-Times appearance of Word documents.

At one point, I discovered a whole new use of \TeX : a fellow student who was acting as a sort of system administrator showed me how to typeset Chinese! I was amazed at the beginning, because I had no idea it was possible. This introduced me to the world of character sets and encoding, and also to font handling in \TeX . I used Werner Lemberg's CJK package, and at that time the fonts that were available with it were bitmap fonts in a special format, hbf, derived from X11's bdf format where the metrics were compressed: since Chinese characters have fixed width, you can save a lot of space by including the metric information only once. There was a small utility for converting hbf to PK that was called by `mktexpk` for each subfont; hence the first runs were usually very long and intimidating. This was quite an abrupt introduction to font issues in \TeX ! I was very happy when I learned, a few years later, that `pdfTeX` could embed TrueType fonts directly.

My most serious use of \TeX was probably when I was responsible for typesetting our school's yearbook. We had a tradition of having people tell about their interests, and type in their favourite quotes, in any language they wanted. And since the *École normale* is a place where you find people with specialized knowledge of many different fields, you were bound to see quotes in many different languages: folk from humanities liked to quote a sentence or two in Ancient Greek, scientific geeks would put a line in Quenya, etc. The yearbook had already been set in \LaTeX for years, and I switched it to Omega that year. The year after me, it was switched to Aleph, and I understand they use $X_{\text{Y}}\TeX$ now. To be completely honest, I have to say that the team-management experience wasn't so good for me, and I never delivered the yearbook to the printer; someone had to take over for me. But I really learned a lot on the technical level.

DW: I see from the *TUGboat* author list that you have written two papers that relate to the use of \TeX for different languages.

1. A brief history of \TeX , volume II (Vol. 29, No. 1, 2008)
2. Putting the Cork back in the bottle—Improving Unicode support in \TeX (Vol. 29, No. 3, 2008)

What motivated your interest in that aspect of \TeX ?

AR: The first article, especially, was inspired by my experience with typesetting many

different languages with \TeX . It was also the subject of my first big talk at a \TeX conference, at EuroBach \TeX in 2007. It was also, of course, related to my interest for history, but I soon realized that I saw it from a particular angle, which made my paper very different from Phil Taylor’s “first volume” with the same title, ten years before mine (I came up with the title independently and contacted Phil Taylor, who of course “allowed” me to use the title for my own talk).

The second paper is a bit different: it described the work I did with Mojca Miklavc on the hyphenation patterns in \TeX Live, in the spring of 2008. We knew that something needed to be done, because all of them were in some 8-bit font encoding, and $X_{\text{Y}}\TeX$ can’t work with that, it expects UTF-8. When it was included in \TeX Live 2007, Jonathan Kew came up with a neat hack where the patterns were automatically converted to UTF-8 when they were loaded by $X_{\text{Y}}\TeX$ (in contrast to Knuth’s \TeX , pdf \TeX , etc.) This worked, but it was much less than satisfactory: you would really like for the patterns to be in UTF-8, and convert them to the appropriate 8-bit encoding if needed, for compatibility. Even more so, actually, as Lua \TeX was coming up in \TeX Live 2008, and it also expects UTF-8 input by default. So we did that—I have to say it was all Mojca’s ideas and inspiration that started it—and Karl gave us his blessing. It was all very quick, and in retrospect somewhat crazy, but now I’m all the more convinced that it needed to be done: the “old” patterns use some tricks, which for some languages date back to \TeX 2, before 1989! There were other weird things; read the paper for the detail.

DW: Where and how did you meet Mojca?

AR: We met at the first Con \TeX t conference in Epen, The Netherlands, in March 2007, and every few months since then. Actually, I already saw her the year before at the Bach \TeX conference, but she claims she doesn’t remember me from that time! We started a lot of projects together, some of which we actually completed in time . . . well, at least one of them, the `hyph-utf8` package I document in my second *TUGboat* paper. She has incredible energy and is extremely committed to everything she does. It may be a bit overwhelming at times! But it’s always great. The Con \TeX t community should be really thankful for everything she achieved.

DW: I believe you have been involved in contributing code to Con \TeX t and Lua \TeX . Please tell me about that and, more generally, how you got involved in \TeX development as well as use.

AR: I can hardly say I contributed code, but I’ve been following their development for a couple of years. I became interested in Lua \TeX in 2006; I remembered being particularly excited during the TUG conference in Marrakesh, when it became clear that Lua \TeX was going to be more than simply Lua + \TeX and was on the verge of becoming the next generation’s \TeX . My interest for Con \TeX t started at the same period.

I did contribute a few bugfixes for Lua \TeX ; I believe I am the first person who compiled it on Mac OS and on Solaris, just like I had been the first one to compile $X_{\text{Y}}\TeX$ on Solaris earlier. I like doing experiments with Lua \TeX and I hope to get the \LaTeX developers to provide better support for it; in fact, the relative lack of reaction of the \LaTeX ’s community to Lua \TeX eventually drove me away from \LaTeX , and I now prefer to use Con \TeX t.

DW: You participated in the Summer of Code last year and you have agreed to serve as an administrator this year if TUG’s application is accepted, about which we should know in a few weeks. [Editor’s note: Google rejected TUG’s application.] First, will you please briefly summarize what the Summer of Code is.

AR: It is a program by Google aiming at attracting students of computer science and other fields to the free software/open source community, started in 2005. It works in a rather simple way: Google first selects organizations creating open source programs (“mentoring organizations”), which are invited to suggest project ideas to students, together with mentoring developer(s) for each project. The students then apply for concrete projects based on these ideas, and the organizations select the ones with the most merit, which are awarded a grant of \$4500 for completing their project during the summer. The mentoring organizations also get \$500 for each successful project.

Last year, three students participated in GSoC with TUG (I was one of them), and when I asked Karl if he was ready to renew the experience in 2009, he told me that he would be fine with pursuing it, as long as I could take care of the bulk of the administrator’s job.

DW: Please tell me how you became involved in the Summer of Code, what participating and being an administrator entails, and what you see as the purpose and value of this activity, especially to the T_EX community.

AR: Again, I have no shame in saying that it was all Mojca’s idea in the beginning, and that I merely helped her to implement it. She didn’t have a precise idea in the beginning, but she felt that there would be benefits to the T_EX community in participating in it, and this prompted me to ask Karl about it, shortly before the program started in March.

I believe the main benefit is to make T_EX development a bit better known in the general open source community and to communicate with other projects. It is a long process but it can be most fruitful on the long term, and Google provides us with a really great infrastructure there: you just go to the GSoC sites and look for a project that may be of interest to the T_EX community (there were over a thousand last year!). It also creates connections inside the community; as far as I am concerned, GSoC is really the reason I came into close contact with Karl.

In comparison, I think the actual projects the students work on are less important, even if that may sound a bit provocative: the important part is bringing the people together with a little incentive, and discussing your goals. Hence, the actual projects (and the \$5000 . . .) are of course essential because nothing would happen without them, but they would be useless if you don’t prepare for them beforehand (and try and draw some conclusion from them afterwards). This is what I intend to do for this year, and I surely hope Google will continue with this program in the future.

DW: You are the president of Groupe francophone des utilisateurs de T_EX. Please tell me how your involvement in GUTenberg started, how you came to be president, and something about the activities of GUTenberg.

AR: I became a member of GUTenberg in 2002, when I was made “T_EX admin” of the student-run workstations at the École normale. I remember buying some T_EX fetish items at that time, like the fluffy T_EX lion the German publisher Lehmann’s made (I later gave it to the son of a Dutch T_EXie). From the outside, the group seemed quite inactive at that time, and I have to say it hasn’t changed much since then. I became member of the board in 2007, and president right after (the president is elected by the board according to our bylaws). We suffer under the same general problems as TUG and the other user groups, I guess, but we also had specific internal problems.

Anyway, I have great hopes for the future. Thanks to T_EX conferences, I realized how active the international T_EX community still was, and even if it’s not comparable to, say, your average GNU/Linux/free software/open source convention, it still attracts enthusiastic new users, and there are a lot of projects. I already met many French people

who seemed really motivated, and I think we will be able to start things over.

One of the most enjoyable feeling that I get from the conferences is that we're building a tight group that is truly international; my first impression was that here in Europe, there were three LUGs leading the march: NTG (Netherlands), DANTE (Germany) and GUST (Poland). The "leaders", so to say, know each other very well and communicate a lot, which is a great asset to the general community. And of course, this helps interaction with TUG, where Karl is always attentive to what happens here. Many recent projects would have never existed without this tight relationship (I'm thinking of Latin Modern, T_EX Gyre, LuaT_EX, mplib . . . to name but a few that I've witnessed over the past years).

DW: Although you mentioned that your new job involved a data structure such as T_EX uses, I got the impression that T_EX isn't actually part of the job. Do you foresee still being able to be involved (and interested) in the world of T_EX?

AR: Indeed, I do not use T_EX at all as part of my job. We're doing databases, and right now I'm polishing an SQL parser, and tearing my hair about all the incompatibilities between the major database engines and the ISO standard (which no one implements and, being basically a two-person company, we're not anywhere near implementing it either). But I'm still fortunate enough to use beamer to make presentations with my boss!

I don't think I will lose interest in T_EX any time soon; it is one of my greatest joys, and, since a few years, most of the trips I've made were because of T_EX conferences. It's thus a great way to combine two of my major hobbies! I also won't forget that my interest in T_EX was the force that drove me to my current career: I simply learnt programming thanks to T_EX. My first modest contribution to a program was a patch for font-related utilities for Omega, in C, which I had been learning from the K&R book, and from thorough reading of files in the T_EX Live source tree. I could go on, but I have probably been praising T_EX a bit too much already.

DW: Thank you for participating in this interview.

AR: Thank *you* for your endeavour, and for your patience during this interview.