
TUG goes to Rio

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TUG 2018 took place in Rio de Janeiro, Brazil, at the *Instituto de Matemática Pura e Aplicada* (IMPA). Most of the foreign attendees had chosen to stay at the ‘official’ hotel, which meant that as well as the formal business, there was plenty of time to talk over breakfast and in the evenings. That was evident in reception the evening before the meeting, and even more so at breakfast on the first morning. This was a good chance to catch up with old friends.

1 Day one

After a (brief) introduction from the conference chair, Paulo Ney de Souza, the floor was handed to Roberto Ierusalimschy to start us with a bang: an overview of Lua development. He gave us an insight into how Lua grew from early beginnings, and how it got picked up by games developers: a big part of Lua’s importance. He then gave us an insight into the two key aspects of Lua’s success: the ability to embed and extend the language. That led to Lua being embedded in a range of applications, not only games but also devices as varied as cars and routers. We had a lively question session, ranging from Unicode support to what might have been done differently if the Lua team didn’t have any users to worry about!

We then moved on to Eduardo Ochs, talking about using Lua as a pre-processor to convert ‘ASCII art’ into complex mathematical diagrams. He explained the history: the origin of ASCII art as comments to help understand sometimes complex \TeX code! After a summary of the original pre-processor, he showed how using $\text{Lua}(\TeX)$, the processing can be done in-line in the file with no true pre-processing step. He showed how this can be set up in an extensible and powerful way, using Lua to do the ‘heavy lifting’.

After the coffee break, we reconvened for three talks. Mico Loretan started, describing his package `selnolig` [4]. He started by showing us examples of ‘unfortunate’ ligatures in English words, and how they can appear when suppressed by `babel` and by `selnolig`. He then focussed in on some details: what a ligature is, why they are needed and how different fonts provide them. He moved on to describe why you need to suppress ligatures, in particular where they cross *morpheme* boundaries. Mico then gave us a very useful summary of how the linguists work here and how they need to link to typography. After showing us the issues with other approaches, he moved on to how `selnolig` uses $\text{Lua}\TeX$ callbacks to influence ligatures ‘late’ in processing. His rule-based interface means that ligatures can be suppressed for whole

classes of words with only a small number of discrete settings. An interesting aspect of this work is how variable the ligature support is in OpenType fonts, in particular what constitutes a ‘common’ ligature.

I spoke next, focussing on `l3build` [11]. I gave a brief overview of $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ testing, from the earliest days of the team to the current day. I covered why we’ve picked Lua for our current testing set-up, what works and what (currently) doesn’t. Looking forward to other talks, the need for PDF-based testing came up in discussions of tagging, and is very much on the `l3build` ‘to do’ list.

Paulo Cereda then talked about his build tool, `arara` [1]. He started with an overview of other tools, before explaining how `arara` is different: it is at heart a ‘no-guesswork’ approach. He showed us the core, simple, syntax, before moving on to a time-line of releases to date. He summed up the new features in version 4.0, before moving to a series of live demonstrations. These started with simple ideas and moved on to new, complex ideas such as conditionals and taking user input. He then finished by looking to the future, both of `arara` and of *araras* (macaws).

Lunch was arranged in the IMPA café, giving us all a chance to absorb the morning’s information and take on all-important sustenance. The café is right by the forest, so we also took the opportunity to take in the local wildlife.

We started back after lunch with a couple of slides from Barbara Beeton, absent from the meeting, presented by TUG President Boris Veytsman. I think everyone was pleased to hear from Barbara, even if at one remove.

Will Robertson then took the podium. He started with some thoughts on questions he gets as an Australian (no \TeX involved). His koala pictures were particularly fun. His talk proper was on his work with the Learning Management System (LMS) used by his employer. This system (Canvas) has a programmable API for controlling information made available to students. He laid out the issues with the documentation he had: a very large, unmaintainable word processing document. Will talked about various tools for creating HTML from $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$, the workflow he has chosen, and then showed more detail on the system he is using, $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}\text{ML}$. He then expanded on how using $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}\text{ML}$ plus scripting, he can populate the LMS in a (semi)automated way, making his work more efficient.

The second speaker in the ‘Australian panel’ session was Ross Moore. Ross started with a demo of why tagging PDFs is needed: making the information accessible not just to people but widely to the computer, to allow re-use in alternative views. He

expanded on the drivers for this, in particular legal requirements for accessible documents.

Our next talk came in remotely from Sandro Coriasco, also dealing with aspects of tagged PDFs for accessibility. He started by outlining the team involved in this work, focussed on making material accessible to the blind. The aim of their work has been targeted at mathematical formula, generating ‘actual text’ which can then be used by screen readers or similar. He finished with a ‘live demo’, and left us with lots to think about.

We then had a non-TeX talk: Doris Behrendt on GDPR. She started by looking at the EU Official Journal on the GDPR, and we had an excursion into the font used for typesetting (Albertina). She then gave details of the regulations, along with a number of extremely amusing examples of how people have approached them.

Presentations over, Boris Veytsman took up the baton again as TUG President, and led a lively TUG AGM discussion: details in a separate item.

The business of the day ended with a discussion (workshop) session looking at technical aspects of tagging PDFs. As one might expect, this large topic could have filled the entire day, and it was clear that the hour we had available was very much laying out a framework for future meetings.

Those of us staying at the official hotel took the minibus back to Ipanema, heading out in the evening to what became the unofficial ‘team bar’ for the meeting. We split into small groups, and talking about TeX or otherwise went on for quite some time!

2 Day two

Frank Mittelbach started the day’s proceedings, talking about his `doc` [5] package for literate programming. He explained the background, what works and more importantly what didn’t. The success of `doc` as a standard makes change challenging, but at the same time there is a need for updates. He then laid out goals for a new version: backward-compatibility, new markup and out-of-the-box `hyperref` support. He showed us the features for creating new markup. There are some wrinkles, for example that `hyperref` support still has to be manually activated. Frank wrapped up by pointing to the testing version, and gave us a likely release date (for TL’19).

I then gave my first talk of the day, looking at `expl3` [10] concepts related to colour and graphics. I outlined the $\LaTeX 2_{\epsilon}$ background, what is happening with the $\LaTeX 2_{\epsilon}$ drivers and then moved on to my `expl3` experiments. First I talked about `colo(u)r`, and the idea of colour expressions as introduced by `xcolor` [3]. These are trivial to work out in `expl3` due

to the expandable FPU we have there. I then looked at creating graphics, particularly how I’ve been inspired by `pgf/TikZ` [9]. I showed how I’ve used the fact that `pgf` has a clear structure, and mapped that to `expl3` concepts. I showed some examples of the existing drawing setup, and where I’ll be going next.

We returned after coffee for a short talk from Boris Veytsman on tackling an apparently simple issue: putting leaders level with the first line of a long title! He showed that this is non-trivial, and how as a contractor he has to explain this to clients. He then showed how he solved the issue, leading to a lively discussion about other possible approaches.

I then came back for my second talk of the day, this time about `siunitx` [13]. I started by explaining the history of the package, starting with the initial `comp.text.tex` post that led to its creation. I outlined the core features, present from version 1, and why I’ve now twice re-written it. I finished by promising a first alpha version of version 3.

Frank then returned for a morning of symmetry, talking about compatibility requirements. He talked about the historical situation, starting from Knuth’s introduction of TeX and taking us through the development of \LaTeX , PDF support and Unicode engines. He then moved on to look at the $\LaTeX 2_{\epsilon}$ approach to compatibility, starting with the 1994 approach, `fixltx2e`. He explained how that was intended to work, and why it didn’t. The new approach, `latexrelease` [12], tackles the same problems but starts with the idea that it applies to both the kernel and to packages. Frank covered the idea of roll-back for packages, and how this works at the user and developer levels. Frank finished off with some thoughts about the future, and the fact that most new users probably pick up these ideas without issue.

Our conference chair, Paulo Ney de Souza, took the first slot after lunch to speak on how he’s approached a major challenge, managing the abstracts for the upcoming ICM 2018 meeting. His talk ranged over topics such as citation formatting, small device output, production workflows and dealing with author preambles. He covered the wide range of tools his team has assembled to automate PDF creation from a heterogeneous set of sources. His wide-ranging talk was a tour de force in automated publication.

After a brief break, we moved to Tom Hejda (who TeX.sx users know as yo’), on his tool `yoin` [2]. He explained that his current workflow for producing journal issues is at present a mix of tools, and this is likely not long-term sustainable. He then moved to showing how `yoin` can be used to compile both the master file for an issue and, as required, each article within it.



Figure 1: Knuthduck

The last talk of the day was from Joachim Heinze, formerly of Springer. He talked about journal publishing, and how online accessibility of publications has changed the landscape for publishers. He gave an entertaining look into this world, posing the question ‘Where is the information we have lost in data?’

With the formal business done, some of the group remained at IMPA for a workshop on R and Knitr, led by Boris Veytsman. I decided to skip that, and to conserve energy for the real business of the meeting: the conference meal! We all met up again for that event at Rubaiyat Rio. This was a chance to unwind, compare notes and of course to present the all-important Duane Bibby original: this year it was given to the Lua team.

3 Day three

The final day of TUG2018 followed the conference banquet, which of course meant that there were a few tired (or missing!) delegates. Luckily, the talks kept us all awake.

The first talk of the day came from S. K. Venkatesan, focussing on his WaTeX tool, and the link to countability of computing problems. He ranged over several fundamental questions in computability.

We then moved to Paulo Cereda (on behalf of Susanne Raab), looking at the TikZducks package [8]. He started by pointing out that whilst drawing ducks is fun, there is serious coding behind it. He showed us a range of examples of how key–value settings allow a wide range of (wacky) customisation of duck drawings. A particular highlight was rendering Don Knuth as a TikZduck (Figure 1).

Once we’d all refuelled, Jaeyoung Choi took the podium to describe work on using Metafont directly inside FreeType. He laid out the advantages of Metafont, and the problems for use by font designers. He then moved to look at the particular challenges faced in developing CJK fonts: the very large number of characters, and resulting significant time/cost investment required. With modern computing power, this can be solved using Metafont to parametrise this large number of glyphs. Jaeyoung demonstrated a GUI which allows control of the appearance of characters in an (almost) interactive way. He then moved

on to look at how to integrate Metafont directly into the TrueType rasteriser.

The final talk came from Will Robertson, on fontspec [7] and unicode-math [6]. He started by showing us some issues in the fonts in books for children, before reviewing unicode-math. He showed how it handles complex maths, allowing re-use of copied material and changing the style of output. He then looked at the development approach he’s taken in ‘cleaning up’ unicode-math and fontspec. He covered various aspects of the expl3/l3build/Git(Hub) workflow he’s now perfected. He then moved on to fontspec, talking about the background, current interfaces and possible future developments. It was a great final talk: wide-ranging, thought-provoking and fun.

With the formal business done, we headed to the roof of IMPA for the traditional conference photograph. After a lunch break, it was off for most of us to the excursion to Sugarloaf Mountain, and the end of the meeting proper. We of course managed to pick the one afternoon of the week where the top of the mountain was hidden in cloud, but the trip up was great fun. Almost all of the foreign delegates were staying for Sunday evening, and several of us availed ourselves once again of the ‘team bar’ for a well-deserved evening of informal chat.

References

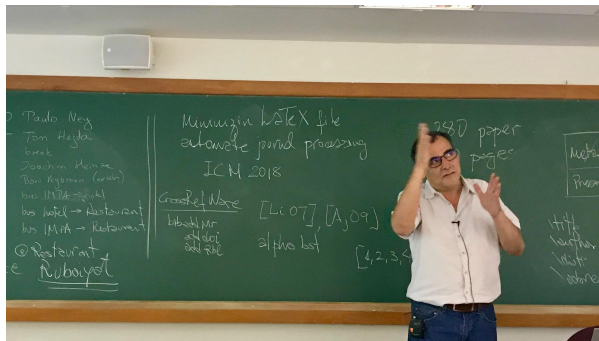
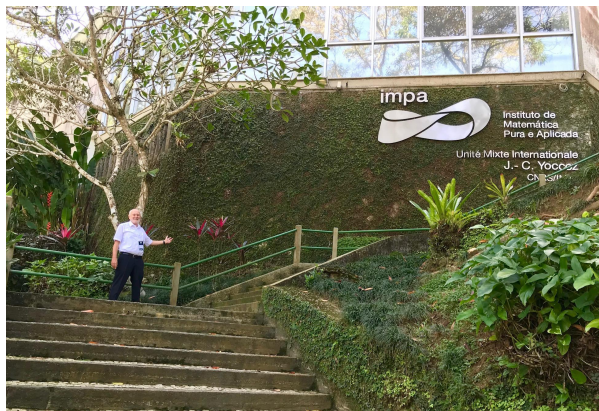
- [1] P. Cereda, M. Daniel, et al. *arara: The cool TeX automation tool*, 2018. ctan.org/pkg/arara
- [2] T. Hejda. *yoin*, 2018. <https://github.com/tohecz/yoin>
- [3] U. Kern. *Extending L^AT_EX’s color facilities: The xcolor package*, 2016. ctan.org/pkg/xcolor
- [4] M. Loretan. *The selnolig package: Selective suppression of typographic ligatures*, 2018. ctan.org/pkg/selnolig
- [5] F. Mittelbach. *The doc and shortvrb packages*, 2018. ctan.org/pkg/doc,shortvrb
- [6] W. Robertson. *Experimental Unicode mathematical typesetting: The unicode-math package*, 2018. ctan.org/pkg/unicode-math
- [7] W. Robertson. *The fontspec package: Font selection for X_YL^AT_EX and LuaL^AT_EX*, 2018. ctan.org/pkg/fontspec
- [8] samcarter. *The TikZducks package: Using ducks in TikZ*, 2018. ctan.org/pkg/tikzducks
- [9] T. Tantau and C. Feuersänger. *TikZ and pgf*, 2015. ctan.org/pkg/pgf
- [10] The L^AT_EX Project. *The expl3 package and L^AT_EX3 programming*, 2018. ctan.org/pkg/l3kernel
- [11] The L^AT_EX Project. *The l3build package: Checking and building packages*, 2018. ctan.org/pkg/l3build

[12] The L^AT_EX Project. The latexrelease package, 2018. ctan.org/pkg/latexrelease

[13] J. Wright. siunitx: A comprehensive (SI) units package, 2018. ctan.org/pkg/siunitx

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