

## Packaging Arsenal fonts for (Xe/Lua)LaTeX

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Typography is an art, and as any art, reflects peoples' lives, tastes, convictions, and views. An important part of the reality today is the process of decolonization, when groups previously not heard acquire voices. This process inspires an interest in the artistic traditions of formerly underrepresented groups, including their writing traditions. The interplay of politics, social movement, and typography in the decolonization era was among the most discussed topics at the recent *Face/Interface* conference at Stanford (a report on this conference can be found in Veytsman (2024a)).

It is not surprising that Ukraine, which was one of the first conquests of Russia, and now struggles to defend its independence, tries to rethink its traditions as different from those of the oppressors. A good illustration of this process may be the recent change of signage for Kyiv metro stations. In Figure 1 is shown the old station name (*Leo Tolstoy Place*) and the new name (*The Place of Ukrainian Heroes*). The change does not just involve the transition from the Russian realities (Leo Tolstoy, while being a great writer, has little to do with Ukraine), but also the transition to a quite distinctive Ukrainian typography, proudly showing off its “Ukraineness”.

The decolonization of art is important not just for the decolonized people, but for the rest of us as well, making our common inheritance richer. I wanted to participate in this process by including in TeX distributions a distinctively Ukrainian font. While



The old signage (Wikimedia Commons, 2024)



The new signage and its author Bohdan Hdal (Яковенко, 2024)

Figure 1: Signage for a Kyiv metro station



Figure 2: Andriy Shevchenko, from [www.ukrainian-type.com/fontarsenal/](http://www.ukrainian-type.com/fontarsenal/)

there is a number of such fonts today, most of them are commercial. Free Ukrainian fonts are often released under licenses incompatible with TeXLive. Fortunately there was a high quality font recently released under Open Font License (OFL). It has a quite interesting history, which we will briefly touch here.

One of the influential cultural establishments of Ukraine is Mystetskyi Arsenal, “The Arsenal of Arts” ([artarsenal.in.ua/en/](http://artarsenal.in.ua/en/)), a museum and art exhibition complex in Kyiv. By the way, the word “Arsenal” itself has a multicultural history, having the origin in Arabic *dār-as-ṣināʿa*, “the house of art/industry”, and probably introduced into modern European languages due to the “Venetian Arsenal”, a complex of shipyards and armories dating to early 12th century (I am grateful to Enrico Gregorio who explained this etymology to me). In 2011 Mystetskyi Arsenal and STAIRSFOR studio conducted a competition for a modern, business-like font in Ukrainian traditions ([www.ukrainian-type.com/about/](http://www.ukrainian-type.com/about/)) (the idea of the competition belongs to Mykhaylo Il’ko). The first prize was ₴100 000 (about €10 000 at that time). According to the competition rules, the winner ought to change the title of the font to *Arsenal* and release it under the OFL.

The competition was won by Andriy Shevchenko (Figure 2). His font has narrow proportions, moderate aperture, and observable contrast. It is clear, neutral and easy to read.

Since the font was released under the OFL, the magic of free software did its work: several people took efforts to extend it. Additional letters were added by Alexei Vanyashin, Marc Foley & cyreal.org, and Vietnamese support was provided by Nhung Nguyen. Now it is quite a mature font, with 715 glyphs ([github.com/alexeiva/Arsenal](https://github.com/alexeiva/Arsenal)).

**Theorem 1 (Residue Theorem).** Let  $f$  be analytic in the region  $G$  except for the isolated singularities  $a_1, a_2, \dots, a_m$ . If  $\gamma$  is a closed rectifiable curve in  $G$  which does not pass through any of the points  $a_k$  and if  $\gamma \approx 0$  in  $G$  then

$$\frac{1}{2\pi i} \int_{\gamma} f = \sum_{k=1}^m n(\gamma; a_k) \operatorname{Res}(f; a_k).$$

**Theorem 2 (Maximum Modulus).** Let  $G$  be a bounded open set in  $\mathbb{C}$  and suppose that  $f$  is a continuous function on  $G^-$  which is analytic in  $G$ . Then

$$\max\{|f(z)| : z \in G^-\} = \max\{|f(z)| : z \in \partial G\}.$$

(a) `math=arsenal+kpsans` option

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(c) `math=iwona` option

**Figure 3:** Mathematical typesetting. The sample text is taken from (Mittelbach and Fischer, 2023).

L<sup>A</sup>T<sub>E</sub>X support (Veytsman, 2024b) was almost embarrassingly easy to write due to the great *fontspec* package (Robertson and The L<sup>A</sup>T<sub>E</sub>X Project Team, 2024). *Arsenal* L<sup>A</sup>T<sub>E</sub>X has usual the options `default` and `sfdefault` to specify the roman or sans serif font as the default, respectively. The option `Scale` allows to select the scaling of the font. The package provides the usual commands to select the normal font, *italic*, **bold**, and **bold italic** versions. The font does not have small caps, but its swash version has all four variants: `\NORMA`, `\ITALIC`, `\BOLD`, and `\BOLD ITALIC`. These variants are selected by the declaration `\swfamily` or the command `\textsw`. The font has relatively rare currency symbols, `\texthryvnia` ₴, `\texttugrik` ₸, `\texttenge` ₸, `\textruble` ₸, as well as printer's devices `\textaldine` Ⓐ, `\textsmilewhite` ☺, `\textsmileblack` ☹. The package provides commands for them.

Mathematical support currently is rather experimental (see Figure 3) The package provides four variants of math support. The option `math=arsenal+kpsans` uses letters from Arse-

nal fonts, adding missing symbols from KpMath Sans font (Flipo, 2024) (Figure 3a). This is the default when LuaL<sup>A</sup>T<sub>E</sub>X is used. Unfortunately, due to a bug in XeL<sup>A</sup>T<sub>E</sub>X, the spacing seems to be off under XeL<sup>A</sup>T<sub>E</sub>X. The option `math=kpsans` uses KpMath Sans for all math (Figure 3b). The option `math=iwona` uses the condensed light Iwona mathematical font (Nowacki, 2010) with the interface (Veytsman, 2024c) (Figure 3c). This is the default for XeL<sup>A</sup>T<sub>E</sub>X. The fourth option, `math=none` is intended for those who want to experiment with their own approaches to math support.

The package is written in the *expl3* language to take advantage of the L<sup>A</sup>T<sub>E</sub>X3 option handling.

Of course, this article is typeset with Arsenal. To give some impression of how Ukrainian looks when typeset with this font, we show a poem by the modern Ukrainian poet Serhiy Zhadan (Figure 4).

Recently Arsenal was chosen as the font of the month for the November 2023 issue of *La Lettre GUTenberg* (Chupin, 2023) (Figure 5). It is both an honor and an opportunity to see the font used in “real life”. Arsenal seems to pass this test rather well. This



Голос із того боку ріки.  
Ранньої осені тихий щоденник.  
Сидять, поклавши на стіл кулаки,  
сільський учитель і сільський священник.

Тепло багатодітних родин.  
Ловиться присмак чогось гіркого.  
– Сьогодні нікого, – каже один.  
– І в мене, – інший говорить, – нікого.

Гілка знадвору хилиться враз.  
Тисне голка чужої кривди.  
– Піду, – каже перший, – прогрію клас.  
Почекаю, може хтось прийде.

– Давай, – говорить інший, – іди.  
Дощі над річищем, наче квіти.  
Попереду вечір і холоди.  
Потрібно чекати.  
Потрібно гріти.

Сергій Жадан, 07.08.21

Figure 4: A poem by Serhiy Zhadan (Жадан, 2023)

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Chers adhérents,

la Lettre précédente est parue le 14 juin dernier. Nous y annonçons les exposés mensuels. Ils ont désormais trouvé leur public et pris leur place dans l'actualité  $\text{\TeX}$  francophone. Ces derniers mois, ils constituent la plus visible des activités de votre association. Qui furent nombreuses, et le présent numéro en rend compte. Maxime Chupin y a largement contribué. Tant par sa traduction d'un article indispensable aux débutants qu'en abordant les nouveautés ou en éditant un grand nombre de textes. Denis Bitouzé a de son côté beaucoup travaillé sur la nouvelle  $\text{\LaTeX}$ . Celle-ci est désormais prête, il vous la présentera le 18 novembre lors de la prochaine journée GUTenberg.

Peut-être vous souvenez-vous qu'il y a trois ans, nous parlions déjà de la nouvelle  $\text{\LaTeX}$ . Trois ans, c'est donc le temps qu'il nous aura fallu pour voir aboutir ce projet, qui rendra de grands services à la communauté francophone. Ainsi va l'activité associative, fondée sur le bénévolat. Certaines idées, trop ambitieuses, sont délaissées ; c'est le cas de la traduction française de la nouvelle édition du  $\text{\LaTeX}$  Companion, évoquée dans le numéro précédent<sup>1</sup>. D'autres projets suivent leur cours : dans la précédente Lettre, nous annonçons

<sup>1</sup> Voir <https://doi.org/10.68028/Letter.v45.127>, en pages 76 et 78 : c'est avec satisfaction que nous utilisons

**Avez-vous pensé à régler votre cotisation ?**  
Si vous avez oublié, ce n'est ni trop tard ni difficile :  
<https://www.gutenberg-asso.fr/?Adherez-en-11gne>

Figure 5: La Lettre GUTenberg, 51, novembre 2023

again proves that national traditions in art have meaning outside the nation's borders, being the legacy of us all.

## Bibliography

- Maxime Chupin. La fonte de ce numéro : Arsenal. *La Lettre GUTenberg*, 51:59–62, 2023. [publications.gutenberg-asso.fr/lettre/article/view/142/151](https://publications.gutenberg-asso.fr/lettre/article/view/142/151).
- Daniel Flipo. *The kpfonts-otf package*. OTF version of the Kp-fonts, 2024. [ctan.org/pkg/kpfonts-otf](https://ctan.org/pkg/kpfonts-otf).
- Frank Mittelbach and Ulrike Fischer. *The  $\text{\LaTeX}$  Companion: Parts I & II*. Addison-Wesley, third edition, 2023.
- Janusz Marian Nowacki. *The iwona package*. A two-element sans-serif font, 2010. [ctan.org/pkg/iwona](https://ctan.org/pkg/iwona).
- Will Robertson and The  $\text{\LaTeX}$  Project Team. *The fontspec package*. Advanced font selection in XeLaTeX and LuaLaTeX, 2024. [ctan.org/pkg/fontspec](https://ctan.org/pkg/fontspec).
- Boris Veytsman. Face/Interface 2023 conference: Global type design and human-computer interaction. *TUGboat*, 45(1):7–10, 2024a. ISSN 0896-3207. [doi.org/10.47397/tb/45-1/tb139veytsman-face](https://doi.org/10.47397/tb/45-1/tb139veytsman-face).
- Boris Veytsman. *The arsenal package*. Open Type font by Andriy Shevchenko, 2024b. [ctan.org/pkg/arsenal](https://ctan.org/pkg/arsenal).
- Boris Veytsman. *The iwonomath package*.  $\text{\LaTeX}$  support for scaled Iwona math fonts, 2024c. [ctan.org/pkg/iwonomath](https://ctan.org/pkg/iwonomath).
- Wikimedia Commons. File:Площа Льва Толстого назва.jpg – wikimedia commons, the free media repository, 2024. [commons.wikimedia.org/w/index.php?title=File:%D0%9F%D0%BB%D0%BE%D1%89%D0%BO\\_%D0%9B%D1%8C%D0%B2%D0%BO\\_%D0%A2%D0%BE%D0%BB%D1%81%D1%82%D0%BE%D0%B3%D0%BE\\_%D0%BD%D0%B0%D0%B7%D0%B2%D0%BO.jpg&oldid=859561010](https://commons.wikimedia.org/w/index.php?title=File:%D0%9F%D0%BB%D0%BE%D1%89%D0%BO_%D0%9B%D1%8C%D0%B2%D0%BO_%D0%A2%D0%BE%D0%BB%D1%81%D1%82%D0%BE%D0%B3%D0%BE_%D0%BD%D0%B0%D0%B7%D0%B2%D0%BO.jpg&oldid=859561010).
- Сергій Жадан. *Скрипниківка*. Meridian Czernowitz, 2023.
- Ірина Яковенко. На станції метро «Площа Українських Героїв» встановили літери для нової назви. *The Village Україна*, April 2024. [www.village.com.ua/village/city/city-news/349665-nastantsiyi-metro-ploscha-ukrayinskih-geroyiv-vstanovili-novu-nazvu](https://www.village.com.ua/village/city/city-news/349665-nastantsiyi-metro-ploscha-ukrayinskih-geroyiv-vstanovili-novu-nazvu).
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