

Author’s guide to typesetting SAIT 2018 abstract

The text of the abstract can be preceded by a brief annotation, if necessary.

This document is the author’s guide for the preparation of abstracts of SAIT conference and at the same time it is a typesetting example. For the typesetting of texts with a lot of equations there are many L^AT_EX commands, it is not possible to describe them all in this guide. The examples, given in this guide, will be enough for the typesetting of the text, without complicated mathematical equations. Descriptions of user-level packages, listed at the end of the manual, can be useful.

To prepare SAIT conference abstract it is recommended to use [ShareLaTeX.com](https://www.sharelatex.com) online editor, see step by step guide at the conference website.

This guide, style file and typesetting examples in three languages can be downloaded from <http://sait.kpi.ua/2018/typeset>.

Abstract preparation. For abstracts in English, Russian, and Ukrainian, one of the following archives is used: `sait2018-en.zip`, `sait2018-ru.zip`, `sait2018-uk.zip`.

The text of the abstract is typeset in the file `sait2018.tex`, the text volume must be 1 or 2 *full* pages (pages must be fully filled with text), extra pages are paid separately. If necessary, custom images can be added to the project. Information about every author is given after the abstract text, is not limited and will be published at the conference website. While writing the abstract, it is useful to compile the file periodically to see the result. When the abstract is finished, the resulting PDF file needs to be saved and enclosed to the [submission form](#) while submitting materials.

Paragraphs. Structured document is easier to read and understand. Text can be easily structured with *paragraphs*. New and/or important words can be *emphasized with italic font*. To start a new paragraph, an empty line is used.

Lists. *Enumerated* and *itemized* lists should be used where possible. Lists, as well as tables, help to structure the information.

1. Example of enumerated list.
2. Nesting lists deeper than two or three levels
 - a) is not recommended.
- Example of itemized list.
 - Element of the second level.
 - * Element of the third level.
1. Enumerated and itemized lists can be mixed
 - in various combinations.

Mathematical formulae. Mathematical formulas in L^AT_EX can be typeset in two modes: inline and between paragraphs. Example of inline formulas: $x \in X$, $X = \{\alpha, \beta, \gamma, \dots, \omega\}$; $(a \leq b) \wedge (b \leq c) \Rightarrow a \leq c$. To typeset mathematical formulas between paragraphs several environments exist (see manuals to packages [amsmath](#) and [mathtools](#), which are included into the class file `saittr18.cls`).

For a single formula, the `equation` environment can be used:

$$\sqrt[4]{\left(\frac{a+b}{a-b}\right)^6} = \sqrt{\frac{a^3+3a^2b+3ab^2+b^3}{a^3-3a^2b+3ab^2-b^3}}, \quad f(x, y, z, t, \alpha) \xrightarrow{x, y, z, t} \max. \quad (1)$$

For several formulas in a row, authors can use `gather` environment

$$(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3, \quad (2)$$

$$(a+b+c)^2 = a^2 + b^2 + c^2 + 2ab + 2ac + 2bc. \quad (3)$$

Here you can specify the information about the grant, in which the study was performed.

or `align` environment:

$$(a + b)^3 = a^3 + 3a^2b + 3ab^2 + b^3, \quad (4)$$

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2ab + 2ac + 2bc. \quad (5)$$

For wide formulas that do not fit in a single line, authors can use environments `multlined` or `aligned` inside `equation`, `gather` or `align`:

$$(a + b + c)^2 + (d + e + f)^2 + (g + h + i)^2 = a^2 + b^2 + c^2 + 2ab + 2ac + 2bc + \\ + d^2 + e^2 + f^2 + 2de + 2df + 2ef + g^2 + h^2 + i^2 + 2gh + 2gi + 2hi. \quad (6)$$

To turn off equation numbering, corresponding star forms of environments exist: `equation*`, `gather*`, `align*`.

For matrices there exist environments `pmatrix`, `bmatrix`, `vmatrix`, and others:

$$A = \begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix}, \quad B = \begin{bmatrix} b_{11} & \cdots & b_{1n} \\ \vdots & \ddots & \vdots \\ b_{21} & \cdots & b_{22} \end{bmatrix}, \quad \Delta = \begin{vmatrix} c_{11} & c_{12} \\ c_{21} & c_{22} \end{vmatrix}, \quad \Gamma = \begin{Bmatrix} \gamma_{11} & \gamma_{12} \\ \gamma_{21} & \gamma_{22} \end{Bmatrix}.$$

For curly braces “if-then” `cases` and `dcases` environments are used (notice the difference between them):

$$f(x) = \begin{cases} \int_0^\infty \varphi(x, t) dt, & x \leq 0, \\ \varphi(x, 0) & \text{in other cases,} \end{cases} \quad g(x) = \begin{cases} \int_0^\infty \psi(x, t) dt, & x \leq 0, \\ \psi(x, 0), & \text{otherwise.} \end{cases}$$

Examples of mathematical operators:

$$\arcsin x, \cos x, \sin x, \arg \max_x f(x), \min_x f(x), \inf_x f(x), \sup_x f(x), \\ \det A, \dim X, \lim_{n \rightarrow \infty} f_n, \exp x, \lg x, \ln x, \log_a x, \sqrt{x}, \sqrt[3]{x}.$$

If necessary, new operators can be declared:

$$\text{const}, \text{div } f, \text{grad } f, \text{opt } f(x), \text{rank } A, \text{sign } x, \text{sp } A, \text{tg } x, \text{tr } A.$$

Operators with indexes and integrals:

$$\sum_{i=1}^n x_i, \sum_{\substack{i,j=1 \\ i \neq j}}^n x_{ij}, \prod_{i=1}^n x_i, \bigoplus_{i=1}^n x_i, \bigcup_{i=1}^n \bigcap_{j=1}^m A_{ij}, \bigvee_{i=1}^n \bigwedge_{i=1}^m A_{ij}, \int_0^\infty, \int_0^\infty f, \iint_0^\infty f, \iiint_0^\infty f.$$

Setting size of paired delimiters manually and automatically:

$$(x), (x), (x), \left(x\right), \left(x\right), \left(\frac{x}{\frac{y}{\sqrt{\frac{z}{w}}}}\right).$$

Additional symbols. Some frequently used symbols of the text mode: `#`, `$`, `%`, `&`, `°`, `\`, `®`, `™`, `→`, `H2O`, `Ca2+`. Greek letters in mathematical mode: `α`, `β`, `γ`, `δ`, `ε`, `ζ`, `η`, `θ`, `ι`, `κ`, `λ`, `μ`, `ν`, `ξ`, `ο`, `π`, `ρ`, `σ`, `τ`, `υ`, `φ`, `χ`, `ψ`, `ω`, `Γ`, `Δ`, `Θ`, `Λ`, `Ξ`, `Π`, `Σ`, `Υ`, `Φ`, `Ψ`, `Ω`. Letters from other alphabets and various symbols: `ℵ`, `ℓ`, `∇`, `∂`, `℔`, `ℑ`, `∃`, `∀`, `∞`, `∅`. Frequently used set symbols: `ℕ`, `ℤ`, `ℝ`, `ℚ`. Arrows: `→`, `←`, `↔`, `⇒`, `⇐`, `⇔`, `↓`, `↑`, `↘`, `↗`. Symbols of operators and relations: `±`, `∩`, `∪`, `\`, `∈`, `∉`, `⊂`, `⊆`, `⊃`, `⊇`, `÷`, `∼`, `α`, `≡`, `≠`, `≠`, `≐`, `≅`, `≈`, `<`, `>`, `≤`, `≥`, `≪`, `≫`, `⊕`, `⊗`, `∘`, `*`, `⋅`, `×`, `⋈`, `∨`, `∧`, `¬`. Strokes and accents: `x'`, `x''`, `x'''`, `\vec{x}` , `\bar{x}` , `\hat{x}` , `\tilde{x}` , `$\overline{1, n}$` . Paired delimiters: `|x|`, `||x||`, `{x}`, `⟨x⟩`, `[x]`, `[x]`. Mathematical fonts: `E`, `F`, `P`; `E`, `F`, `P`; `E`, `F`, `P`; `E`, `F`, `P`; `ℰ`, `ℱ`, `ℙ`; `ℓ`, `ℱ`, `ℙ`; `ℓ`, `ℱ`, `ℙ`; `ℰ`, `ℱ`, `ℙ`.

The full list of symbols can be found in [The Comprehensive L^AT_EX Symbol List](#). The class file `saittr18.cls` allows to use commands and symbols from the following packages: `amsmath`, `amssymb`, `dsfont`, `esint`, `mathrsfs`, `mathtools`, `textcomp`.

Theorems and definitions. To typeset theorems, lemmas, statements, definitions, and corollaries, special environments should be used. Each theorem or lemma can be numbered or not numbered. Optional argument of the environment allows to explicitly state the notion described or theorems and lemmas authors.

Definition 1. Text of the definition.

Definition (notion being defined). Definition without a number.

Statement 1. Text of the statement.

Statement (name of the statement). Text of the statement.

Lemma 1 (on something). Text of the lemma.

Lemma 2. Lemma without a number.

Theorem 1. Text of the theorem.

Theorem (Ivanov–Petrov, 2010). Theorem without a number.

Corollary 1 (sufficiency). Text of the corollary.

Corollary. Corollary without a number.

Tables. Tables allow to present numeric and textual information compactly and clearly. Like figures, tables can be placed between paragraphs as well as on the side of the text. To typeset tables inside the `table` environment, authors can use environments `tabular` or `tabularx`.

For typesetting tables, class file `saittr18.cls` includes commands from packages `makecell`, `tabularx`, `multirow`.

Table 1. Example of table on the side of the text

X	A	B	C	D	E
Row	1	2	3	4	5

Table 2. Example of wide table placed between text paragraphs

Column 1	Column 2	Column 3
While typesetting tables,	authors can use commands from	<code>makecell</code> , <code>tabularx</code> , <code>multirow</code> .

Figures. Diagrams, charts and sensible illustrations facilitate the understanding of the text. It is allowed to use both vector (PDF), and raster images (PNG, JPG, GIF), although the vector images should be preferred.

Broad figures should be placed between text paragraphs, narrow and small look good on the side of the text. Note that if the figure is on the side of the text, the `wrapfigure` environment should be placed *before* the paragraph.

L^AT_EX uses a special algorithm to place figures and tables which are typeset between paragraphs, so these figures and tables can “float” on the page and can appear in the place other than the author expected them to be in. This is not a bug, but a rule of “floating” objects laying out.

Files with figures must be located in the same folder as the abstract file. In the abstract text image file names are specified without extensions (.pdf, .png, etc.).

Vector graphics is preferred over raster, because vector images look good on any scale. To create charts and diagrams directly in the abstract text authors can use `PGF`.

Combining tables and figures. If possible, it is better to place the figures and tables at the side of the text, this saves page space and allows to fit more text. If that can’t be achieved, you can place in one row several figures (fig. 3, 4), figures and tables (fig. 5, table 3), or several tables (tables 4, 5). Both figures and tables can be referenced in the text by adding the label to the header of the image.



Figure 1. Example of small image on the side of the text



Figure 2. Example of vector image floating between paragraphs



Figure 3. First figure



Figure 4. Second figure



Figure 5. Figure near the table

Table 3. Table near the figure

X	A	B	C	D	E
Row	1	2	3	4	5

Table 4. First table

X	A	B	C	D	E
Row	1	2	3	4	5

Table 5. Second table

Y	F	G	H	I	J
Row 1	6	7	8	9	10
Row 2	11	12	13	14	15

Programming code. Programming code fragment example:

```
@verbatim_environment_is
def ined():
    for typesett in g:
        program_code(in.any['programming'].language)
```

Miscellaneous. Hyperlinks can be included in the text, e.g. sait.kpi.ua or [SAIT Conference](#). Footnotes can also be used¹.

Additional packages. Commands from the following packages, that are *already included* to the style file, are available to authors Mathematical symbols and formulas — [amsmath](#), [amssymb](#), [dsfont](#),

¹The footnote text is placed at the bottom of the page.

`esint`, `mathrsfs`, `mathtools`, `maybemath`, `textcomp`, `tips`; figures and tables — `array`, `graphicx`, `makecell`, `multirow`, `subcaption`, `tabularx`, `wrapfig`.

Typesetting bibliography citations. Each bibliography entry should have a reference in the text of abstract. An example of putting the reference to the bibliography: [1–3].

References. **1.** The bibliography may contain from 1 to 10 entries. **2.** APA or IEEE bibliography styles may be used. **3.** APA, en.wikipedia.org/wiki/APA_style. **4.** IEEE, www.ieee.org/documents/ieeecitationref.pdf.