

XPC: AUTO-PAGINATION

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(English: Tech. notes)

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The electronic versions were generated from sources marked up in [L^AT_EX](#) after incorporating all the sketches provided by the author, in a computer running GNU/LINUX operating system. PDF was typeset using [Xe_LTeX](#) from [T_EXLive](#) 2020. The base font used is Cormarant Garamond Medium at 10 pt.

Cover: Zen art by Ayisha Sasidharan specially for Sayahna.

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XPC — L^AT_EX technologies create beautiful PDFs on the fly from XML input

Description

- eXtensible Markup Language or XML is a markup language with a long list of real world applications. One of the application for XML is long term data archival.
- We have discussed earlier about how XML files are used in rendering proofs for HTML based frameworks and its disadvantages. Since XML has become an important part of data storage, we can never completely avoid it.
- XML Page Composition or XPC, developed by STM DOCS is a typesetting system in the cloud which can automatically create standards-compliant and aesthetically pleasing PDF using T_EXFolio directly from a valid production XML, assets and metadata. T_EXFolio is the T_EX based typesetting framework in the cloud.

Challenges faced

Following challenges were faced during the initial testing phase.

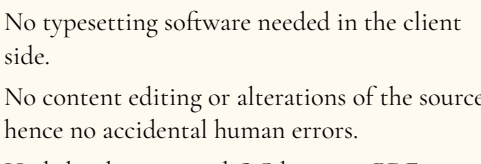
- Automation of table cell width calculation.
- Automation of float placement.
- Automation of QC for the PDF output.
- Cross-platform.
- Pagination using a control file.

These challenges were overcome in the different testing phases and now we have a stable product.

Features

XPC offers a lot of features such as:

- XPC workflow is in the cloud.



- Fully automated workflow.
- No typesetting software needed in the client side.
- No content editing or alterations of the source, hence no accidental human errors.
- High-level automated QC between PDF output and XML.
- Formatting/pagination of PDF output, if required, is done using a control file generated from the XML without even touching the XML data.
- Application of Artificial Intelligence for table formatting and float placement, thereby reduces manual effort and enables quick processing.
- Multilingual support (currently configured for 11 languages).
- Automatic table width calculation which helps typeset tables in single or double column modes without any processing instructions.

C.A. Levin, S.R. Bell and A.C. Stuart Journal 31 (2018) 390–397

Table 1
Characteristics of study participants.
Source: Taken from <http://dx.doi.org/10.7717/peerj.7474>

	GIS-N(n = 22)	GIS-P(n = 44)	P-value
Age(year)	29.86 ± 3.76	30.15 ± 4.02	0.7662
parity	18 (81.82%)	37 (84.10%)	0.8133
multiparity	4 (18.18%)	7 (15.91%)	
Use of hormonal contraceptives	20 (90.9%)	38 (82.2%)	0.0094
History of bacterial vaginosis	5 (22.73%)	8 (18.18%)	0.6016
Vaginal cleanliness			0.5873
1-0 grade	13 (59.09%)	29 (65.9%)	
22-IV grade	9 (40.91%)	15 (34.1%)	

Shannon

Unweighted Unifrac Distance

Fig. 1. Comparison of the β -diversity (Shannon index) based on the OTU profile in GIS-positive group and GIS-negative group. The p value was calculated by the Wilcoxon rank-sum test.
Source: Taken from: <http://dx.doi.org/10.7717/peerj.7474>

Fig. 2. PCA of bacterial beta diversity based on the unweighted Unifrac distance and weighted Unifrac distance. GIS-negative and GIS-positive groups are colored in green and orange, respectively.
Source: Taken from: <http://dx.doi.org/10.7717/peerj.7474>

tumor of the second rank. In this sense, we write $\tilde{h}_{21}, \tilde{h}_{11}, \tilde{h}_{12}$ in place of h_1, h_2, h_3 respectively. Paying attention to the skew-symmetry of \tilde{h}_{ij} , the first three equations may be written in the form

$$\frac{\partial \tilde{h}_{ij}}{\partial X_j} = \frac{1}{2} \frac{\partial \tilde{h}_{ij}}{\partial X_j} + \frac{1}{2} \tilde{h}_{ij} \quad (3)$$

In contrast to \tilde{h} , \tilde{h} appears as a quantity which has the same type of symmetry as an angular velocity. The divergence equations then take the form

Theorem 1.1. A polynomial time computable function $f = \{f_{ij}\}$ is ϵ -functionally one-way if there is no probabilistic polynomial time algorithm which (with probability of the form $1 - k^{-c}$ for some $c > 0$) outputs on input $y \in \{0, 1\}^k$ a random element of $f^{-1}(y)$. Let \mathcal{A}_g be a real arrangement. Then $|\text{Charm}(\mathcal{A}_g)| = \pi(\mathcal{A}_g, 1)$.

Proof. Let X be an object of $\text{Cal}^{\text{tr}}(\mathcal{S})$. In the following diagram, all the squares are pullbacks and all arrows are in \mathcal{M} . The maps marked f, f' are the source and target maps for the base change along f , so $X[M]$ is in $\text{Cal}^{\text{tr}}(\mathcal{S})$. The same argument holds for groupoids *verbatim*. We check the properties required in Corollary 2 in [14]: (i) follows from

$$\pi(\Phi_i, 1) = 1, \text{ and (ii) is a consequence of Corollary 1 in [13].}$$

$$X_1 \times_{X_2} X_1 \xrightarrow{\quad} X_1$$

$$\downarrow \quad \quad \downarrow f$$

$$X_1 \xrightarrow{\quad} X_2$$

Since multiplication is associative, there is a well-defined map $X_1 \times_{X_2} X_1 \times_{X_2} X_1 \rightarrow X_1$, which will also be denoted by \tilde{m} . We now turn to Maxwell's equations and introduce the notation:

$$\begin{pmatrix} \tilde{\phi}_{21} & \tilde{\phi}_{11} & \tilde{\phi}_{12} & \tilde{\phi}_{14} & \tilde{\phi}_{14} \\ \tilde{h}_{21} & \tilde{h}_{11} & \tilde{h}_{12} & -\tilde{e}_2 & -\tilde{e}_2 \\ \tilde{j}_1 & \tilde{j}_1 & \tilde{j}_2 & \tilde{j}_4 & \tilde{j}_4 \\ \tilde{c}_1 & \tilde{c}_1 & \tilde{c}_2 & \tilde{c}_2 & \tilde{c}_2 \end{pmatrix} \quad (4a)$$

$$\begin{pmatrix} \tilde{j}_1 & \tilde{j}_1 & \tilde{j}_2 & \tilde{j}_4 & \tilde{j}_4 \\ \tilde{c}_1 & \tilde{c}_1 & \tilde{c}_2 & \tilde{c}_2 & \tilde{c}_2 \end{pmatrix} \quad (4b)$$

as one can easily verify by substituting from Eqs. (4a) and (4b). Equations Eqs. (4a) and (4b) have a tensor character, and are therefore co-variant with respect to Lorentz transformations, if the $\tilde{\phi}_{ij}$ and the \tilde{j}_i have a tensor character, which we assume. Consequently, the laws for transforming these quantities from one to another allowable (inertial) system of co-ordinates are uniquely determined.

- APIs available to support command-line operations for automation.
- Automated report PDF generation, which contains all the required information about the output PDF.

Production Report of PDF from: [jstmdocs05.xml](#)
T_EXFolio on July 26, 2020

Report of first call/insertion: fig

ID	Call: Page	Obj Ins	Tolerance
fig1	390	391	1
fig2	390	391	1
fig3	390	392	2
fig4	390	393	3
fig5	390	395	5

Report of first call/insertion: tbl

ID	Call: Page	Obj Ins	Tolerance
tbl1	390	392	2
tbl2	390	394	4
tbl3	390	394	4
tbl4	390	394	4
tbl5	390	390	0

Report of total number of objects

Object	Total No
FM-author(s)	3
FM-author footnote	3
mark(s)	3
FM-affiliation(s)	3
FM-abstract(s)	4
FM-keyword(s)	3
TEXT-section(s)	7
FLOAT-Tbl	5
b	23
fig	5
TEXT-unnumbered	17
TEXT-eqgrp	35
MISC-interref	12
TEXT-equation	23
tbl	5
TEXT-graphic(s)	5
FLOAT-Fig	5
TEXT-enun	2
ufd	2
fd	1
fn1	1
TEXT-footnote(s)	2
tblfn	1
fn2	1
Tail-references	23

- Provides data protection by eliminating the need for manual intervention with the source code.

Results

- 70% of the test files were created fully automated without any manual intervention.
- Huge improvement in time taken for processing an article when compared to manual methods.
- Currently at a capacity of handling 250 article per day (Average of 15 pages per article).

Epilog

- The content that Sayahna includes in these Phone PDFs are those that can be read in under thirty to forty minutes. Computers or Desktop applications are not necessary for reading them.
- The PDFs are made available in beautiful, rich formats and can be easily read from your smart phones. They are customized to adhere perfectly with the dimensions of your phone screen.
- Most smartphones these days are equipped with in-built readers for PDF content. However, the free Adobe Acrobat Reader application offers the best reading experience. We would recommend that you install Adobe readers in your phones and use them for reading our content.
- Anybody who is interested in open access publishing and want to submit their work to Sayahna may do so by mailing it to [<info@sayahna.org>](mailto:info@sayahna.org). The work could be anything from stories, memoirs, articles, interviews, movie reviews, poems, plays, sketches or paintings; the only stipulation being that they should be succinct enough to be read under thirty to sixty minutes.
- Sayahna welcomes all your thoughts on our efforts! You may either mail them to [<info@sayahna.org>](mailto:info@sayahna.org) or post them under the Comments section in this [web page](#). We eagerly await your feedbacks and hope to derive from them the necessary impetus to drive Sayahna to new heights.