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12 **Title 3**
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14 ANNE-MARIE ROMMERDAHL, SDU, Denmark
15 JEREMY ALEXANDER RAMÍREZ GALEOTTI, SDU, Denmark
16 DIMITRIOS DAFNIS, SDU, Denmark
17 NASIFA AKTER, SDU, Denmark
18 MOHAMMAD HOSEIN KARDOUNI, SDU, Denmark
19 BEN TROVATO* and G.K.M. TOBIN*, Institute for Clarity in Documentation, USA
20 LARS THØRVÄLD, The Thørväld Group, Iceland
21 VALERIE BÉRANGER, Inria Paris-Rocquencourt, France
22
23 A clear and well-documented L^AT_EX document is presented as an article formatted for publication by ACM in a conference proceedings or journal publication. Based on the "acmart" document class, this article presents and explains many of the common variations, as well as many of the formatting elements an author may use in the preparation of the documentation of their work.
24
25 CCS Concepts: • **Do Not Use This Code → Generate the Correct Terms for Your Paper**; *Generate the Correct Terms for Your Paper*; Generate the Correct Terms for Your Paper; Generate the Correct Terms for Your Paper.
26 Additional Key Words and Phrases: Do, Not, Use, This, Code, Put, the, Correct, Terms, for, Your, Paper
27
28 **ACM Reference Format:**
29 Anne-Marie Rommerdahl, Jeremy Alexander Ramírez Galeotti, Dimitrios Dafnis, Nasifa Akter, Mohammad Hosein Kardouni, Ben Trovato, G.K.M. Tobin, Lars Thørväld, and Valerie Béranger. 2018. Title 3. In *Proceedings of Make sure to enter the correct conference title from your rights confirmation email (Conference acronym 'XX)*. ACM, New York, NY, USA, ?? pages. <https://doi.org/XXXXXXX>.
30 XXXXXXXX
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41 **1 Introduction**
42 ACM's consolidated article template, introduced in 2017, provides a consistent L^AT_EX style for use across ACM publications, and incorporates accessibility and metadata-extraction functionality necessary for future Digital Library endeavors. Numerous ACM and SIG-specific L^AT_EX templates have been examined, and their unique features incorporated into this single new template.
43
44 If you are new to publishing with ACM, this document is a valuable guide to the process of preparing your work for publication. If you have published with ACM before, this document provides insight and instruction into more recent changes to the article template.
45
46 The "acmart" document class can be used to prepare articles for any ACM publication — conference or journal, and
47 Manuscript submitted to ACM
48 for any stage of publication, from review to final "camera-ready" copy, to the author's own version, with *very few*¹
49 changes to the source.

2 Background and Related Work

Software reuse is a broad term, that refers to the practice of reusing previously written code, rather than coding from scratch. It is one of the key practices of software engineering. It is in fact such an important part of software engineering, that one of the ways to measure the quality of software is by its 'Reusability' [?] - i.e. the degree to which the application or its components can be reused. There are many different ways to do reuse in software engineering. Software libraries and frameworks are good examples of software that are intended to be reused. Developers may also scour the internet for things such as open-source software, or code snippets from websites like StackOverflow, which can be reused.

as 'rare'. Most studied systems offered catalogs of "reusable functions or examples of predefined processes", but they were found to be generic, or have a limited scope[?]. There have been proposed some ideas on how to promote reuse for LCPs, such as the strongly-typed rich templating language OSTRICH, developed for the model-driven low-code platform OutSystems. OutSystems provides scaffolding mechanisms for common development patterns and sample screen templates, both designed by experts on domain-specific languages (DSL). The practice of using templates in the OutSystems platform involves cloning and modifying samples, which may require more knowledge than the end-user possesses. The goal of OSTRICH is to remove this need for adaption when using templates, to remove the knowledge-barrier when making use of the available templates. This is done by abstracting and parameterizing the templates. A limitation of OSTRICH, is that it currently only supports the top nine most used production-ready screen templates from OutSystems. The end-user may not create and save their own templates, nor can they re-apply a template which they have customized.

Another approach focused on enabling model reuse by converting and merging heterogeneous models together into several graphs, which are then merged into one single graph (The Knowledge Graph), which acts as the repository of models. The Knowledge Graph can be queried to predict the next modeling step, based on the model being constructed by the user. This approach focuses on how to store, query, recommend and integrate the pre-defined models efficiently. End-Users can also persist their own models to the repository for later reuse.

For citizen developers, this feature of recommending models which have been constructed by domain experts and then developed by model experts could prove very useful. However, while the user may persist their own models, the study is clearly not focused on guiding the user towards reusing their own models.

On the other hand, some existing LCDPs offer the user the ability to create their own models - for example by defining a new block in a block-based tool[?].

Building on the ideas discussed for improving reuse in low-code development platforms (LCDPs), several popular tools show these concepts in action. For instance, Webflow[?] is a leading low-code platform that offers a wealth of features for building responsive websites. One of its standout features is the ability to create reusable components and UI kits, which can significantly speed up the development process. With Webflow's intuitive interface, developers can quickly design and prototype components, and then reuse them across multiple pages and projects.

In a similar way, Mendix[?] takes this further for full enterprise apps by offering shareable building blocks like simple actions (microflows) and UI parts that anyone on a team can grab and use again without recoding. Through its Marketplace, a free online hub, you can download ready templates, connectors for tools like Salesforce, and basic setups that fit right into new projects, making everything faster and more uniform. This approach builds on the flexibility seen in platforms like Webflow, but adds strong team tools and AI suggestions to spot and create reusable pieces, empowering even beginners to build complex apps while keeping reuse simple and widespread.

OutSystems[?] further enhances the concept of reuse in low-code development platforms by emphasizing rapid application delivery through its robust set of features. Like Webflow and Mendix, OutSystems also provides a library of reusable components and templates that help developers complete projects faster. Its user-friendly visual development environment allows users to easily drag and drop elements while connecting with existing systems. OutSystems also supports teamwork with built-in version control and feedback features, making it easy for teams to share and improve reusable components. Additionally, the platform uses AI to suggest the best solutions and components for specific tasks, helping to streamline the development process. By encouraging reuse at both individual and team levels, OutSystems enables organizations to create scalable applications quickly while ensuring quality and consistency.

In order to analyze how block-based robotics environments address reuse area, 4 representative platforms were compared: mBlock, MakeCode, SPIKE LEGO, VEXcode GO and Open Roberta. The comparison focused on three main dimensions of reuse: structural reuse (through user-defined blocks or functions), social reuse (through sharing or remixing existing projects), and interoperable reuse (through import/export capabilities).

Table 1. Block Based Robotics Environments Reuse Support

Platform	Structural Reuse	Social Reuse	Interoperable Reuse	Reuse Support
VEXcode GO	X	X		Medium
mBlock	X	X	X	Medium
MakeCode	X	X	X	Medium
Spike Lego	X		X	Low
Open Roberta		X		Low

In this context, “reuse support” represents a scale that measures how effectively each platform facilitates reuse-related features. High reuse support indicates that users can easily create, share, and adapt existing components or projects. Medium reuse support suggests that some reuse mechanisms are available but limited in scope or flexibility. Low reuse support implies that the platform provides only minimal or restricted features to promote reuse and improve user productivity.

As shown in Table 1, although these platforms include reusability features, they are quite limited, as none of them provide users with clear guidance on how to use these tools effectively, which restricts their ability to fully leverage them.

Despite all of the useful features that these tools have, none of them provides guidance to the end-users to create custom reusable components which is the key feature of our project.

Research also indicates that block based programming environments should guide the end users towards good code organization as many may lack the necessary knowledge or may become stuck due to errors.[?] Although block based programming tools like Blockly were invented to teach programming to beginners by simple examples, Mayr-Dorn et al. mention that it is possible to express even large and highly complex real-world robot programs with the language concepts offered by these kind of block-based tools. [?]

3 Study Design

3.1 Problem Investigation

3.1.1 Problem Context and Motivation. End-user development (EUD) for collaborative robots (cobots) presents unique challenges, particularly for users without formal programming training. In domains such as chemistry laboratories, educational robotics, and industrial settings, end-users need to program robots to perform specific tasks but often lack the software engineering knowledge to write maintainable, well-structured code.

One critical challenge in EUD is code reuse. Users frequently create repetitive code because they struggle to recognize duplicate patterns, lack knowledge about abstraction mechanisms, or find existing tools too complex to use effectively. This problem manifests in several ways: programs become unnecessarily long and difficult to maintain, small changes require modifications in multiple locations increasing the risk of errors, and users miss opportunities to learn fundamental programming concepts such as modularity and abstraction.

157 In visual programming environments like Open Roberta Lab, don't provide assistance in identifying when code
158 should be reused or how to extract repeated sequences into reusable components.
159

160 3.1.2 Stakeholder Analysis.

- 161 • **Chemistry Laboratory Personnel:** Chemists and lab technicians who use cobots for repetitive tasks such as
162 sample preparation, dispensing, mixing, and quality control procedures. They possess deep domain expertise in
163 chemistry but limited programming knowledge, often creating long, repetitive programs that become difficult
164 to maintain when adapting experimental protocols. Their primary need is to quickly create and modify robot
165 programs without becoming programming experts.
166

168 169 170 Table 2. Functional and Non-Functional Requirements

Type	ID	Description	Priority
Functional	FR1	Detect duplicate/similar block sequences	High
	FR2	Visually highlight detected duplications	High
	FR3	Suggest creation of reusable custom blocks	High
	FR4	Allow users to accept/reject suggestions	High
Non-Functional	NFR1	Seamless Open Roberta Lab integration	High
	NFR2	Intuitive interface for end users	High
	NFR3	No interference with existing workflow	High
	NFR4	Clear visual feedback during detection	High

186 3.1.3 Artifact Requirements.

188 3.2 Treatment Design

190 Our treatment focuses on developing a guided reuse assistant for the OpenRoberta Lab environment. The purpose
191 of this tool is to help users recognize when parts of their robot programs can be reused, and to make it easier for
192 them to create reusable custom blocks. By doing this, we aim to reduce repetitive code and help users learn important
193 programming concepts such as modularity and abstraction.
194

195 196 197 198 199 3.2.1 *Overview of the Tool.* The guided reuse assistant is built as an extension inside Open Roberta Lab, which uses the
 Blockly framework. The assistant runs directly in the web browser and interacts with the user's block workspace. Its
 main job is to look through the user's program, find repeated sequences of blocks, and guide the user in turning them
 into reusable blocks.

200 The tool works in three main steps:

- 202 (1) **Detecting Repeated Code:** The assistant automatically scans the user's program and searches for parts that
203 look the same or very similar. These are marked as potential duplicates.
- 204 (2) **Highlighting and Suggesting Reuse:** Once duplicates are found, the system highlights them in the workspace
205 and shows a message suggesting that these sections could be made into a reusable block (function). This helps
206 users see repetition they might not have noticed before.

- 209 (3) **Helping the User Create a New Block:** If the user agrees to the suggestion, the assistant opens a small guide
210 to help them create the new block. It automatically detects any small differences between the repeated parts,
211 such as numbers or variable names, and turns them into inputs (parameters) for the new block. When the block
212 is created, all the repeated code is replaced by calls to this new reusable block.
213
214
215
216

217 3.3 Treatment Validation

218 The treatment validation for this study adopts a mixed-methods evaluation approach to assess the effectiveness of
219 the proposed features for guiding users in creating reusable custom blocks within the OpenRoberta environment.
220 Participants will be recruited from local educational institutions, specifically chemistry students and teachers who
221 frequently engage in laboratory work. A sufficient number of participants will be selected to ensure a diverse range of
222 experience levels with block-based programming. The experimental setup will take place in a controlled environment,
223 where participants will be divided into two groups: one using the enhanced OpenRoberta platform with guided block
224 creation features, and the other using the standard version without these enhancements. The procedure will begin with
225 a pre-test to evaluate participants' prior understanding of modular programming concepts, followed by a series of tasks
226 in which they will create reusable blocks from given code segments. Participants' interactions with the platform will be
227 observed throughout the experiment. Data collection will include both quantitative measures, such as task completion
228 time and accuracy in creating reusable blocks and qualitative feedback obtained through post-task interview. The
229 analysis will compare performance metrics between the two groups and apply thematic analysis to the qualitative
230 data to identify user experiences and perceptions of the new features' usability and effectiveness. This comprehensive
231 evaluation will provide a detailed understanding of how useful and effective is the block creation guidance feature to
232 the end-users.
233
234

235 Existing block-based environments provide mechanisms for reuse, but lack intelligent support to help users recognize
236 and apply reuse in practice.

237 To address this gap, our project introduces a guided reuse assistant within the Open Roberta Lab environment. The
238 tool is designed to help users identify and apply reuse more easily while creating their robot programs. It works by
239 automatically scanning a user's block-based program to detect repeated code segments that appear in different parts of
240 the workspace. Once these duplicates are found, the system highlights them visually, drawing the user's attention to
241 patterns that could be simplified.

242 When repeated blocks are detected, the assistant suggests creating a reusable custom block (function). It then helps
243 the user generate this new block by identifying the small differences between the repeated parts—such as numbers,
244 variables, or parameters—and turning these differences into inputs for the new block. After the user confirms, the
245 system automatically replaces all the repeated sequences with calls to the newly created reusable block.

246 By combining ideas from procedural abstraction (organizing code into meaningful, reusable parts) and automated
247 refactoring (improving code through intelligent transformations), our tool aims to make block-based programming
248 more structured and efficient. It encourages users to build programs that are modular and easier to maintain, helps
249 reduce unnecessary repetition, and supports learning by making the concept of reuse clear and hands-on.

250 In summary, our work bridges the gap between existing theoretical approaches to software reuse and their real-world
251 application in block-based programming environments. Through this guided and semi-automated approach, we aim to
252 make reuse visible, understandable, and practical for end-users working in Open Roberta.
253
254

261 4 Modifications

262 Modifying the template – including but not limited to: adjusting margins, typeface sizes, line spacing, paragraph and
263 list definitions, and the use of the \vspace command to manually adjust the vertical spacing between elements of your
264 work – is not allowed.

265 Your document will be returned to you for revision if modifications are discovered.

266 5 Typefaces

267 The “acmart” document class requires the use of the “Libertine” typeface family. Your TeX installation should include
271 this set of packages. Please do not substitute other typefaces. The “lmodern” and “lmodern” packages should not be used,
272 as they will override the built-in typeface families.

275 6 Title Information

277 The title of your work should use capital letters appropriately - <https://capitalizemytitle.com/> has useful rules for
278 capitalization. Use the title command to define the title of your work. If your work has a subtitle, define it with the
279 subtitle command. Do not insert line breaks in your title.

281 If your title is lengthy, you must define a short version to be used in the page headers, to prevent overlapping text.

282 The title command has a “short title” parameter:

284 \title[short title]{full title}

286 7 Authors and Affiliations

288 Each author must be defined separately for accurate metadata identification. As an exception, multiple authors may
289 share one affiliation. Authors’ names should not be abbreviated; use full first names wherever possible. Include authors’
290 e-mail addresses whenever possible.

292 Grouping authors’ names or e-mail addresses, or providing an “e-mail alias,” as shown below, is not acceptable:

294 \author{Brooke Aster, David Mehldau}
295 \email{dave,judy,steve@university.edu}
296 \email{firstname.lastname@phillips.org}

298 The authornote and authornotemark commands allow a note to apply to multiple authors – for example, if the
299 first two authors of an article contributed equally to the work.

301 If your author list is lengthy, you must define a shortened version of the list of authors to be used in the page headers,
302 to prevent overlapping text. The following command should be placed just after the last \author{} definition:

304 \renewcommand{\shortauthors}{McCartney, et al.}

306 Omitting this command will force the use of a concatenated list of all of the authors’ names, which may result in
307 overlapping text in the page headers.

308 The article template’s documentation, available at <https://www.acm.org/publications/proceedings-template>, has a
309 complete explanation of these commands and tips for their effective use.

311 Note that authors’ addresses are mandatory for journal articles.

313 **8 Rights Information**

314
315 Authors of any work published by ACM will need to complete a rights form. Depending on the kind of work, and the
316 rights management choice made by the author, this may be copyright transfer, permission, license, or an OA (open
317 access) agreement.

318 Regardless of the rights management choice, the author will receive a copy of the completed rights form once it
319 has been submitted. This form contains L^AT_EX commands that must be copied into the source document. When the
320 document source is compiled, these commands and their parameters add formatted text to several areas of the final
321 document:

- 323 • the “ACM Reference Format” text on the first page.
- 324 • the “rights management” text on the first page.
- 325 • the conference information in the page header(s).

326 Rights information is unique to the work; if you are preparing several works for an event, make sure to use the
327 correct set of commands with each of the works.

328 The ACM Reference Format text is required for all articles over one page in length, and is optional for one-page
329 articles (abstracts).

333 **9 CCS Concepts and User-Defined Keywords**

334 Two elements of the “acmart” document class provide powerful taxonomic tools for you to help readers find your work
335 in an online search.

336 The ACM Computing Classification System — <https://www.acm.org/publications/class-2012> — is a set of classifiers
337 and concepts that describe the computing discipline. Authors can select entries from this classification system, via
338 <https://dl.acm.org/ccs/ccs.cfm>, and generate the commands to be included in the L^AT_EX source.

339 User-defined keywords are a comma-separated list of words and phrases of the authors’ choosing, providing a more
340 flexible way of describing the research being presented.

341 CCS concepts and user-defined keywords are required for all articles over two pages in length, and are optional
342 for one- and two-page articles (or abstracts).

347 **10 Sectioning Commands**

348 Your work should use standard L^AT_EX sectioning commands: \section, \subsection, \subsubsection, \paragraph,
349 and \ subparagraph. The sectioning levels up to \subsubsection should be numbered; do not remove the numbering
350 from the commands.

351 Simulating a sectioning command by setting the first word or words of a paragraph in boldface or italicized text is
352 **not allowed**.

353 Below are examples of sectioning commands.

357 **10.1 Subsection**

358 This is a subsection.

359 *10.1.1 Subsubsection.* This is a subsubsection.

360 *Paragraph.* This is a paragraph.

365
366
367 Table 3. Frequency of Special Characters
368
369
370
371
372

Non-English or Math	Frequency	Comments
\emptyset	1 in 1,000	For Swedish names
π	1 in 5	Common in math
\$	4 in 5	Used in business
Ψ_1^2	1 in 40,000	Unexplained usage

373
374
375
376
377
378
379
380 Table 4. Some Typical Commands
381

Command	A Number	Comments
\author	100	Author
\table	300	For tables
\table*	400	For wider tables

382 Subparagraph This is a subparagraph.
383384
385

11 Tables

386 The “acmart” document class includes the “booktabs” package — <https://ctan.org/pkg/booktabs> — for preparing
387 high-quality tables.
388389 Table captions are placed *above* the table.390 Because tables cannot be split across pages, the best placement for them is typically the top of the page nearest
391 their initial cite. To ensure this proper “floating” placement of tables, use the environment **table** to enclose the table’s
392 contents and the table caption. The contents of the table itself must go in the **tabular** environment, to be aligned
393 properly in rows and columns, with the desired horizontal and vertical rules. Again, detailed instructions on **tabular**
394 material are found in the *L^AT_EX User’s Guide*.
395396 Immediately following this sentence is the point at which Table ?? is included in the input file; compare the placement
397 of the table here with the table in the printed output of this document.
398399 To set a wider table, which takes up the whole width of the page’s live area, use the environment **table*** to enclose
400 the table’s contents and the table caption. As with a single-column table, this wide table will “float” to a location deemed
401 more desirable. Immediately following this sentence is the point at which Table ?? is included in the input file; again, it
402 is instructive to compare the placement of the table here with the table in the printed output of this document.
403404 Always use midrule to separate table header rows from data rows, and use it only for this purpose. This enables
405 assistive technologies to recognise table headers and support their users in navigating tables more easily.
406407
408

12 Math Equations

409 You may want to display math equations in three distinct styles: inline, numbered or non-numbered display. Each of
410 the three are discussed in the next sections.
411412
413

12.1 Inline (In-text) Equations

414 A formula that appears in the running text is called an inline or in-text formula. It is produced by the **math** environment,
415 which can be invoked with the usual \begin{...} \end construction or with the short form \$...\$. You can use
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any of the symbols and structures, from α to ω , available in L^AT_EX [?]; this section will simply show a few examples of in-text equations in context. Notice how this equation: $\lim_{n \rightarrow \infty} x = 0$, set here in in-line math style, looks slightly different when set in display style. (See next section).

12.2 Display Equations

A numbered display equation—one set off by vertical space from the text and centered horizontally—is produced by the **equation** environment. An unnumbered display equation is produced by the **displaymath** environment.

Again, in either environment, you can use any of the symbols and structures available in L^AT_EX; this section will just give a couple of examples of display equations in context. First, consider the equation, shown as an inline equation above:

$$\lim_{n \rightarrow \infty} x = 0 \quad (1)$$

Notice how it is formatted somewhat differently in the **displaymath** environment. Now, we'll enter an unnumbered equation:

$$\sum_{i=0}^{\infty} x + 1$$

and follow it with another numbered equation:

$$\sum_{i=0}^{\infty} x_i = \int_0^{\pi+2} f \quad (2)$$

just to demonstrate L^AT_EX's able handling of numbering.

13 Figures

The “figure” environment should be used for figures. One or more images can be placed within a figure. If your figure contains third-party material, you must clearly identify it as such, as shown in the example below.

Your figures should contain a caption which describes the figure to the reader.

Figure captions are placed *below* the figure.

Every figure should also have a figure description unless it is purely decorative. These descriptions convey what's in the image to someone who cannot see it. They are also used by search engine crawlers for indexing images, and when images cannot be loaded.

A figure description must be unformatted plain text less than 2000 characters long (including spaces). **Figure descriptions should not repeat the figure caption – their purpose is to capture important information that is not already provided in the caption or the main text of the paper.** For figures that convey important and complex new information, a short text description may not be adequate. More complex alternative descriptions can be placed in an appendix and referenced in a short figure description. For example, provide a data table capturing the information in a bar chart, or a structured list representing a graph. For additional information regarding how best to write figure descriptions and why doing this is so important, please see <https://www.acm.org/publications/taps/describing-figures/>.

13.1 The “Teaser Figure”

A “teaser figure” is an image, or set of images in one figure, that are placed after all author and affiliation information, and before the body of the article, spanning the page. If you wish to have such a figure in your article, place the command immediately before the `\maketitle` command:



Fig. 1. 1907 Franklin Model D roadster. Photograph by Harris & Ewing, Inc. [Public domain], via Wikimedia Commons. (<https://goo.gl/VLCRBB>).

```

500
501 \begin{teaserfigure}
502   \includegraphics[width=\textwidth]{sampleteaser}
503   \caption{figure caption}
504   \Description{figure description}
505 \end{teaserfigure}
506
507
508
509
510
511
512
513
```

14 Citations and Bibliographies

The use of BibTeX for the preparation and formatting of one's references is strongly recommended. Authors' names should be complete — use full first names ("Donald E. Knuth") not initials ("D. E. Knuth") — and the salient identifying features of a reference should be included: title, year, volume, number, pages, article DOI, etc.

The bibliography is included in your source document with these two commands, placed just before the `\end{document}` command:

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```

521 \bibliographystyle{ACM-Reference-Format}
522 \bibliography{bibfile}
523

```

where “`bibfile`” is the name, without the “`.bib`” suffix, of the BibTeX file.

Citations and references are numbered by default. A small number of ACM publications have citations and references formatted in the “author year” style; for these exceptions, please include this command in the **preamble** (before the command “`\begin{document}`”) of your L^AT_EX source:

```

529 \citetstyle{acmauthoryear}
530

```

Some examples. A paginated journal article [?], an enumerated journal article [?], a reference to an entire issue [?], a monograph (whole book) [?], a monograph/whole book in a series (see 2a in spec. document) [?], a divisible-book such as an anthology or compilation [?] followed by the same example, however we only output the series if the volume number is given [?] (so Editor00a’s series should NOT be present since it has no vol. no.), a chapter in a divisible book [?], a chapter in a divisible book in a series [?], a multi-volume work as book [?], a couple of articles in a proceedings (of a conference, symposium, workshop for example) (paginated proceedings article) [? ?], a proceedings article with all possible elements [?], an example of an enumerated proceedings article [?], an informally published work [?], a couple of preprints [? ?], a doctoral dissertation [?], a master’s thesis: [?], an online document / world wide web resource [? ? ?], a video game (Case 1) [?] and (Case 2) [?] and [?] and (Case 3) a patent [?], work accepted for publication [?], ‘YYYYb’-test for prolific author [?] and [?]. Other cites might contain ’duplicate’ DOI and URLs (some SIAM articles) [?]. Boris / Barbara Beeton: multi-volume works as books [?] and [?]. A presentation [?]. An article under review [?]. A couple of citations with DOIs: [? ?]. Online citations: [? ? ?]. Artifacts: [?] and [?].

546 15 Acknowledgments

Identification of funding sources and other support, and thanks to individuals and groups that assisted in the research and the preparation of the work should be included in an acknowledgment section, which is placed just before the reference section in your document.

This section has a special environment:

```

553 \begin{acks}
554 ...
555 \end{acks}
556

```

so that the information contained therein can be more easily collected during the article metadata extraction phase, and to ensure consistency in the spelling of the section heading.

Authors should not prepare this section as a numbered or unnumbered `\section`; please use the “`acks`” environment.

562 16 Appendices

If your work needs an appendix, add it before the “`\end{document}`” command at the conclusion of your source document.

Start the appendix with the “`appendix`” command:

```

568 \appendix
569

```

and note that in the appendix, sections are lettered, not numbered. This document has two appendices, demonstrating the section and subsection identification method.

573 17 Multi-language papers

574
575 Papers may be written in languages other than English or include titles, subtitles, keywords and abstracts in different
576 languages (as a rule, a paper in a language other than English should include an English title and an English abstract).
577 Use `language=...` for every language used in the paper. The last language indicated is the main language of the paper.
578 For example, a French paper with additional titles and abstracts in English and German may start with the following
579 command
580

```
581 \documentclass[sigconf, language=english, language=german,  

582                         language=french]{acmart}
```

583 The title, subtitle, keywords and abstract will be typeset in the main language of the paper. The commands
584 `\translatedXXX`, `XXX` begin title, subtitle and keywords, can be used to set these elements in the other languages. The
585 environment `translatedabstract` is used to set the translation of the abstract. These commands and environment have
586 a mandatory first argument: the language of the second argument. See `sample-sigconf-i13n.tex` file for examples of
587 their usage.
588

589 18 SIGCHI Extended Abstracts

590
591 The “sigchi-a” template style (available only in L^AT_EX and not in Word) produces a landscape-orientation formatted
592 article, with a wide left margin. Three environments are available for use with the “sigchi-a” template style, and
593 produce formatted output in the margin:
594

- 595** **sidebar:** Place formatted text in the margin.
- 596** **marginfigure:** Place a figure in the margin.
- 597** **margintable:** Place a table in the margin.

598 601 Acknowledgments

602 To Robert, for the bagels and explaining CMYK and color spaces.

603 605 A Research Methods

606 607 A.1 Part One

608 Lorem ipsum dolor sit amet, consectetur adipiscing elit. Morbi malesuada, quam in pulvinar varius, metus nunc
609 fermentum urna, id sollicitudin purus odio sit amet enim. Aliquam ullamcorper eu ipsum vel mollis. Curabitur quis
610 dictum nisl. Phasellus vel semper risus, et lacinia dolor. Integer ultricies commodo sem nec semper.
611

612 613 A.2 Part Two

614 Etiam commodo feugiat nisl pulvinar pellentesque. Etiam auctor sodales ligula, non varius nibh pulvinar semper.
615 Suspendisse nec lectus non ipsum convallis congue hendrerit vitae sapien. Donec at laoreet eros. Vivamus non purus
616 placerat, scelerisque diam eu, cursus ante. Etiam aliquam tortor auctor efficitur mattis.
617

618 619 B Online Resources

620 Nam id fermentum dui. Suspendisse sagittis tortor a nulla mollis, in pulvinar ex pretium. Sed interdum orci quis metus
621 euismod, et sagittis enim maximus. Vestibulum gravida massa ut felis suscipit congue. Quisque mattis elit a risus ultrices
622 commodo venenatis eget dui. Etiam sagittis eleifend elementum.
623

624 Manuscript submitted to ACM

625 Nam interdum magna at lectus dignissim, ac dignissim lorem rhoncus. Maecenas eu arcu ac neque placerat aliquam.
626 Nunc pulvinar massa et mattis lacinia.
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