RecurSIA-RRT: Recursive maximal point-set pattern discovery in music

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Abstract. SIATEC computes the translational equivalence class (TEC) of each maximal translatable pattern (MTP) in its input point set, D. In the output of SIATEC, each TEC is encoded as a pair, $\langle P, T\rangle$, in which P is an MTP and T is a set of vectors ("translators") that map P onto its occurrences in D. Several algorithms have been proposed for selecting a subset of the TECs computed by SIATEC that efficiently covers the input point set, D. These TEC cover algorithms adopt various greedy strategies that prefer TECs with high compression factors. Two novel techniques are presented here to improve the compression factor achieved using TEC cover algorithms. First, an algorithm, RecurSIA, is presented, that recursively applies a selected TEC cover algorithm to the pattern, P, in each TEC. Second, a technique is presented tha
which takes a point set, D, and a TEC covering algorithm, A, as its arguments. RecurSIA first applies A to D, which outputs a set of TECs, S. Each TEC in S is a pair, $\langle P, T\rangle$, where P is a pattern and T is a set of translators. RecurSIA applies itself to the pattern, P, in each TEC in S, which typically results in a more compressed encoding of each pattern P. The second compression-enhancement technique presented here involves pruning redundant translators from the set, T, in each TEC in the computed cover. A translator, $v \in T$, is considered redundant if it can be removed from T without changing the covered set of T. Ideally, we would want to find for each T, one of the smallest subsets of T such that the covered set is the same as that for the full T. However, this is an NP-hard problem. An efficient approximation algorithm is proposed that typically gives a good solution.
The abstract should briefly summarize the contents of the paper in 150–250 words.

Keywords: First keyword · Second keyword · Another keyword.

1 First Section

1.1 A Subsection Sample

Please note that the first paragraph of a section or subsection is not indented. The first paragraph that follows a table, figure, equation etc. does not need an indent, either.

Subsequent paragraphs, however, are indented.

Sample Heading (Third Level) Only two levels of headings should be numbered. Lower level headings remain unnumbered; they are formatted as run-in headings.

Sample Heading (Fourth Level) The contribution should contain no more than four levels of headings. Table 1 gives a summary of all heading levels.

Table 1. Table captions should be placed above the tables.

Heading level	Example	Font size and style
Title (centered)	**Lecture Notes**	14 point, bold
1st-level heading	**1 Introduction**	12 point, bold
2nd-level heading	**2.1 Printing Area**	10 point, bold
3rd-level heading	**Run-in Heading in Bold.** Text follows	10 point, bold
4th-level heading	*Lowest Level Heading.* Text follows	10 point, italic

Displayed equations are centered and set on a separate line.

$$x + y = z \tag{1}$$

Please try to avoid rasterized images for line-art diagrams and schemas. Whenever possible, use vector graphics instead (see Fig. 1).

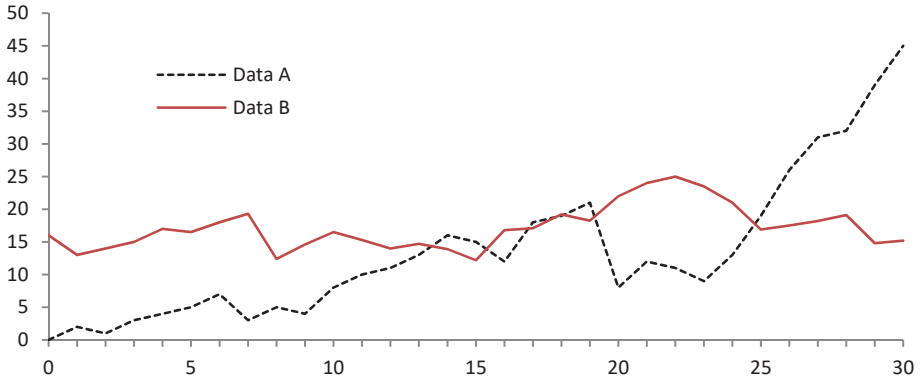

Fig. 1. A figure caption is always placed below the illustration. Please note that short captions are centered, while long ones are justified by the macro package automatically.

Theorem 1. *This is a sample theorem. The run-in heading is set in bold, while the following text appears in italics. Definitions, lemmas, propositions, and corollaries are styled the same way.*

Proof. Proofs, examples, and remarks have the initial word in italics, while the following text appears in normal font.

For citations of references, we prefer the use of square brackets and consecutive numbers. Citations using labels or the author/year convention are also acceptable. The following bibliography provides a sample reference list with entries for journal articles [1], an LNCS chapter [2], a book [3], proceedings without editors [4], and a homepage [5]. Multiple citations are grouped [1–3], [1, 3–5].

References

1. Author, F.: Article title. Journal **2**(5), 99–110 (2016)
2. Author, F., Author, S.: Title of a proceedings paper. In: Editor, F., Editor, S. (eds.) CONFERENCE 2016, LNCS, vol. 9999, pp. 1–13. Springer, Heidelberg (2016). https://doi.org/10.10007/1234567890
3. Author, F., Author, S., Author, T.: Book title. 2nd edn. Publisher, Location (1999)
4. Author, A.-B.: Contribution title. In: 9th International Proceedings on Proceedings, pp. 1–2. Publisher, Location (2010)
5. LNCS Homepage, http://www.springer.com/lncs. Last accessed 4 Oct 2017