

Arranging an Audio Track to other Genres by using CycleGAN-based Deep Learning Model *

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Abstract

Changing the genre of a song is one of the methods used when composing music. To the best of our knowledge, musicians usually add their new ideas to the song, while trying to keep most of the special characteristics of the original song when arranging music. Similar to other artistic tasks that require human creativity, converting the genre of a song takes a significant amount of time and effort. In this project, we propose a method to translate a music genre by using machine-learning, which can generate a new song with comparably less amount of time than humans. Specifically, we utilized cycleGAN based model to translate a soundtrack to another soundtrack.

Due to the complexity and difficulties of dealing with audio data, our model is able to handle files written with MIDI (Musical Instrument Digital Interface) specification only with specific characteristics. In the near future, we expect to expand our project to use regular audio files rather than MIDI to do our tasks to generalize our model. By doing so, we hope our model to be used for the general public without further modifications.

1. Introduction

This template is based on the CVPR conference template.

The information in this template is very minimal, and this file should serve you as a framework for writing your report. You may prefer to use a more collaboration-friendly tool while drafting the report with your class mates before you prepare the final report for submission. Remember that you should **submit both the report and code** you used for this project via Canvas. Also, **only one member per team** needs to submit the project material.

This is an example of a mathematical equation:

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Method	Accuracy
Method 1	$70 \pm 3 \%$
Method 2	$76 \pm 3 \%$

Table 1. This is an example of a table.

$$f(\mathbf{x}; \mathbf{w}) = \sum_{i=1}^n w_i x_i.$$

This is a mathematical expression, $h(\mathbf{x}) = \hat{y}$ formatted in text.

The project report should be 6-8 pages long (not counting references) and should contain the sections that are already provided in this paper. Please check out the text in these sections for further information.

1.1. Subsection

You can use paragraphs or subsections to further structure your main sections. This is an example of a subsection.

This is a paragraph title. This is an example of a paragraph.

2. Related Work

Related work should be discussed here. This is an example of a citation [1]. To format the citations properly, put the corresponding references into the bibliography.bib file. You can obtain BibTeX-formatted references for the "bib" file from Google Scholar (<https://scholar.google.com>), for example, by clicking on the double-quote character under a citation and then selecting "BibTeX" as shown in Figure 1 and Figure 2.

Table 2 shows an example for formatting a table.

3. Proposed Method

Describe the method(s) you are proposing, developing, or using. I.e., details of the algorithms may be included here.

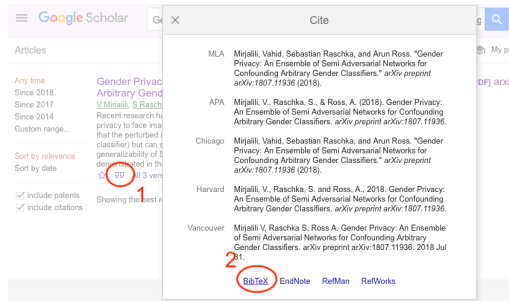


Figure 1. Example illustrating how to get BibTeX references from Google Scholar as a 1-column figure.

References

- [1] V. Mirjalili, S. Raschka, and A. Ross. Gender privacy: An ensemble of semi adversarial networks for confounding arbitrary gender classifiers. *arXiv preprint arXiv:1807.11936*, 2018.

4. Experiments

Describe the experiments you performed. You may want to create separate subsections to further structure this section.

4.1. Dataset

Briefly describe your dataset in a separate subsection.

4.2. Software

Briefly list (and cite) software software you used.

4.3. Hardware

If relevant, list hardware resources you used.

5. Results and Discussion

Describe the results you obtained from the experiments and interpret them. Optionally, you could split "Results and Discussion" into two separate sections.

6. Conclusions

Describe your conclusions here. If there are any future directions, you can describe them here, or you can create a new section for future directions.

7. Acknowledgements

List acknowledgements if any. For example, if someone provided you a dataset, or you used someone else's resources, this is a good place to acknowledge the help or support you received.

8. Contributions

Describe the contributions of each team member who worked on this project.

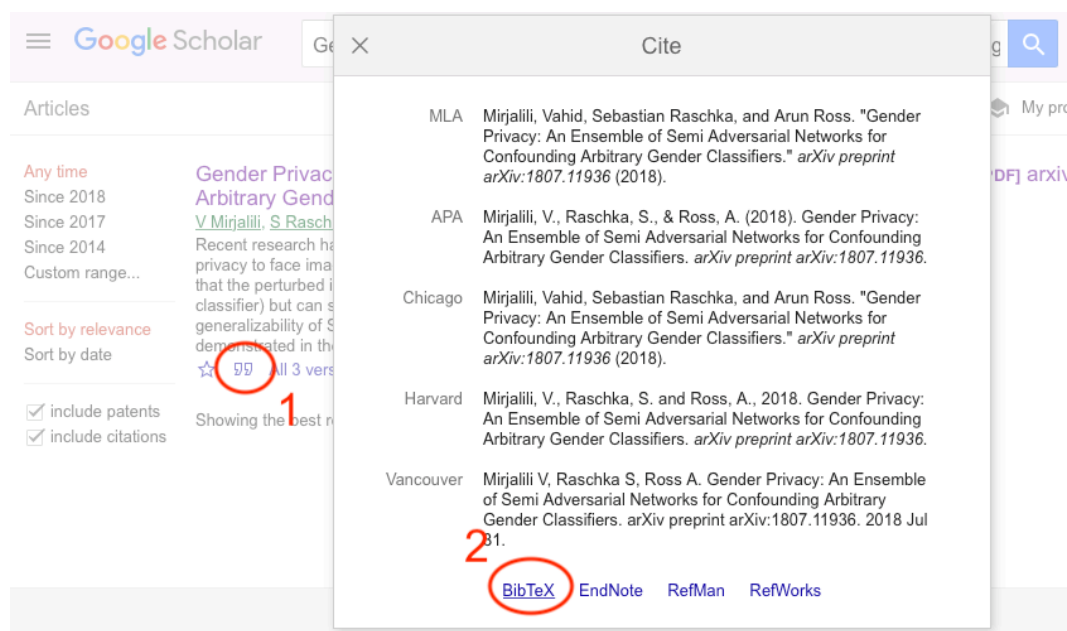


Figure 2. Example illustrating how to get BibTeX references from Google Scholar as a 2-column figure.