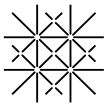

University of Basel

Location-based Queries and Query representation for the Lifelog Search Challenge 2021

Bachelor thesis

Natural Science Faculty of the University of Basel
Department of Mathematics and Computer Science
Databases and Information Systems (DBIS)
https://dbis.dmi.unibas.ch/

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28.07.2021

Abstract

This thesis discusses the thesis template using some examples of the Turing Machine.

Table of Contents

1 Introduction

This is the introduction to the thesis template. The goal is to give students a starting point on how to format and style their Bachelor or Master thesis[1].
Please make sure to always use the most current version of this template, by downloading it always from the original git repository:

http://www.github.com/ivangiangreco/unibas-latex

We will use throughout this tutorial some references to Turing's imitation game [**?**] and the Turing machine [**?**]. You may be interested in reading these papers.

The package comes with an option regarding the bibliography style. You can include the package with

```
\usepackage[citeauthor]{basilea}
```

to be able to cite authors directly with

```
\citet{turing:1950}
```

If the option is enabled, then the following reference should print Turing [2]: **?**]

[1] This document also shows how to use the template.

2
Body of the Thesis

This is the body of the thesis.

2.1 Structure

2.1.1 Sub-Section

2.1.1.1 Sub-Sub-Section

Paragraph

Even Sub-Paragraph This is the body text. Make sure that when you reference anything you use labels and references. When you refer to anything, you normally capitalise the type of object you reference to, e.g. Section 2.1 instead of section 2.1. You may also just use the `cref` command and it will generate the label, e.g., for Section 2.1, we did not specify the word "Section".
Hint: Try to structure your labels as it is done with `sec:my-label` and `fig:machine`, etc.

2.2 Equations

A Turing Machine is a 7-Tuple:

$$M = \langle Q, \Gamma, b, \Sigma, \delta, q_0, F \rangle \tag{2.1}$$

A Turing Machine is a 7-Tuple even if defined in the text, as in $M = \langle Q, \Gamma, b, \Sigma, \delta, q_0, F \rangle$.

2.3 Tables

Some tables can also be used as shown in Table 2.1[2]. Remember that tables might be positioned elsewhere in the document. You can force positioning by putting a `ht!` in the definition.

Table 2.1: Frequency
after the caption, oth

Title
The chemical ba
On computable n
Computing mach

[2] Table captions are normally above the table.

2.4 Figures

Figures are nice to show concepts visually. For organising well your thesis, put all figures in the Figures folder. Figure **??** shows how to insert an image into your document. Figure 2.2 references a figure with multiple sub-figures, whereas the sub-figures are referenced by Fig. 2.2(a), etc.

2.5 Packages

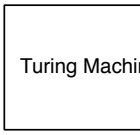
These packages might be helpful for writing your thesis:

caption to adjust the look of your captions

glossaries for creating glossaries (also list of symbols)

makeidx for indexes and the back of your document

algorithm, algorithmicx, algpseudocode for adding algorithms to your document



(a) Turing Mach

Figure 2.2: Plots of f

Missing: Description figure.

3
Conclusion

This is a short conclusion on the thesis template documentation. If you have any comments or suggestions for improving the template, if you find any bugs or problems, please contact me.

Good luck with your thesis!

4 Notes

4.1 LSC 2020 Papers

4.1.1 Interactive Lifelog Retrieval with vitrivr (LSC20_DBIS)

what is LSC: In the lifelog search challenge, different multimedia retrieval systems compete in finding secific data. The teams must find a video or a picture as fast as possible. Therefore, it is important to make the queries as efficient and as user friendly as possible.
Dataset: The dataset consists of 115 days of videos and pictures(193'911) collected during a lifelog. Lifelogger record their everyday life (body mounted camera). Thus, the dataset is huge and is perfectly suitable and advantageous for testing, developing and improving multimedia retrieval systems and has spatio-temporal features. To make it possible to query for the images, they are equipped with information (such as local time, geo location, sensor readings for heart rate, tepos, speed and other metadata).
vitrivr: vitrivr is a multimedia retrieval stack and consists of three layers. In the third layer, Cottontail DB, the data is permanently saved. The middle layer, Cineast, is responsible for the extraction of features and processing queries from the first layer, Vitrivr NG. With Vitrivr NG, the user can formulate and combine queries and in the end, get the result data visualized. It is possible to retrieve audio, images, video and 3D models.
how to get multiple query containers? (red part in paper)
Existing functionalities in vitrivr:

- Pictures taken in a day belong together such as keyframes in videos. The data model is called *Image Sequence Media Type*. Each single images of the serie is mapped to a media segment. The media segments belong to a single media object in the data model. (The features are generated per media segment)
- With boolean queries, the user can search for a specific time, location, time span and so on.(example weekday=Wednesday)
- With Vitrivr NG, it is possible to refine the result set with filters during browsing.

New functionalities:

- temporal scoring-it is possible to add a time property where the user can query "canyon occurs before bridge **within 30s.**". After the queries for "brigde" and "canyon" are executed and fused, the multimedia objects of the result set are then examined (for the time). The segments of the multimedia objects are temporally ordered.
- deep learning based semantic concepts
- staged querying: Previously, when querying for a building and a white blob, two lookups would run independently against the entire collection. There would be only a few results and alot of false positives only containing one of the required features because of the OR relation. With the new early filtering, the user can first query for a building, then on the new resulting subset instead of the entire collection, query for white blob. With this technique, there are less false negatives.

A

Appendix

Declaration on Scientific Integrity
Erklärung zur wissenschaftlichen Redlichkeit

includes Declaration on Plagiarism and Fraud
beinhaltet Erklärung zu Plagiat und Betrug

Author — Autor
Sanja Popovic

Matriculation number — Matrikelnummer
18-054-593

Title of work — Titel der Arbeit
Location-based Queries and Query representation for the Lifelog Search Challenge 2021

Type of work — Typ der Arbeit
Bachelor thesis

Declaration — Erklärung
I hereby declare that this submission is my own work and that I have fully acknowledged the assistance received in completing this work and that it contains no material that has not been formally acknowledged. I have mentioned all source materials used and have cited these in accordance with recognised scientific rules.

Hiermit erkläre ich, dass mir bei der Abfassung dieser Arbeit nur die darin angegebene Hilfe zuteil wurde und dass ich sie nur mit den in der Arbeit angegebenen Hilfsmitteln verfasst habe. Ich habe sämtliche verwendeten Quellen erwähnt und gemäss anerkannten wissenschaftlichen Regeln zitiert.

Basel, 28.07.2021

Signature — Unterschrift