University of Zurich[UZH]

Department of Informatics

University of Zürich
Department of Informatics
Binzmühlestr. 14
CH-8050 Zürich
Phone. +41 44 635 43 11
Fax +41 44 635 68 09
www.ifi.uzh.ch/dbtg

UZH, Dept. of Informatics, Binzmühlestr. 14, CH-8050 Zürich

Prof. Dr. Michael Böhlen
Professor
Phone +41 44 635 43 33
Fax +41 44 635 68 09
boehlen@ifi.uzh.ch

Zürich, 15. Dezember 2021

MSc Thesis
Topic: Indexing Videos Containing Human Motion in the Form of Dance

Currently, many information retrieval systems utilize a textual interface to elicit the information needs of a user. While this works perfectly well for searching and analyzing text-based collections, there are application domains in which textualizing a query or content is much harder. One of these domains is dancing. Describing a large number of different human poses with words is very difficult.

In a previous MSc project ("Retrieval and Visual Analysis of Dance Moves"), Vasiliki Arpatzoglou and Artemis Kardara, two MSc students, preprocessed a video collection of ballet videos, extracting the data in form of timeseries data containing stick figure models of the dancer in each frame. The two students built a visualization tool and did some preliminary work on similarity measures.

The goal of this MSc thesis is to pick up where the other students left off: to investigate similarity measures more closely and build an index structure to speed up the retrieval process.

Tasks

1. Using the extracted and processed data from the previous project, develop different variants of similarity measures for the multidimensional timeseries data generated out of actual dance videos.
2. Evaluate the quality of the similarity measures developed in the first step by clustering the data collection.
3. Investigate a lower bound proposed by Keogh to filter data [1] and utilize this filter in building an index that approximates subsequences of frames in the videos.
4. Evaluate and tune the performance of the index.

5. Integrate the index into a (multimedia) retrieval system, e.g. vitrivr or Gemini.
6. Optional: develop a visual interface for querying the video collection.
7. Write the thesis.
8. Present the thesis in a DBTG meeting (25 minutes presentation).

References

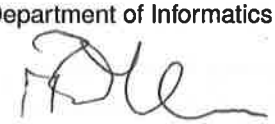
[1] E. Keogh. Exact indexing of dynamic time warping. In *Proceedings of the 28th International Conference on Very Large Data Bases*, VLDB '02, page 406–417. VLDB Endowment, 2002.

Supervisor: Sven Helmer (helmer@ifi.uzh.ch)

Start date: 1 November 2021

End date: 30 April 2022

University of Zurich
Department of Informatics



Prof. Dr. Michael Böhlen
Professor