

Master's Thesis Review

Prague, January 23, 2020

Title: Dance Recognition from Audio Recordings
Author: Tomáš Pavlín
Date received: January 7, 2020

The thesis presents a method for automatic recognition of dance classes given audio recordings, i.e. recognizing ballroom dances (e.g. Waltz, Jive, Rumba). The first part of the thesis reviews a related literature, concluding that despite there exists a significant number of papers on general music genre classification (e.g. Classical, Jazz, Rock), any commercial software or any recent paper on dance recognition have not existed to the best of our knowledge. The technical part of the thesis describes the proposed method, a sliding-window convolutional neural network that takes spectrogram as an input. Excellent results are achieved as reported in the experiments. The method is exhaustively tested on several dataset including recordings downloaded from YouTube, low-quality recordings captured by mobile phones on dance competitions, or on music from Stardance, a Czech version of 'Strictly Come Dancing' TV show. A robustness against contamination by background noise is studied using synthesized data. Besides a standard academic implementation of the method, Tomáš prepared a convincing web demo, where a user either submits a sample recording from file or records it by a device microphone. The processing runs on server, but results are immediately sent to the user.

The thesis is an extensive research report, presenting an original and novel method. Since the method is impressively accurate, it has a practical or perhaps even a commercial potential. The problem is non-trivial, and the success was by far not easily anticipated at the beginning. Tomáš took the challenge very responsibly, he was motivated and enthusiastic about the topic and keen on learning recent pattern recognition techniques. Tomáš proved he has been able to do the research, studying relevant papers, prototyping, making experiments, evaluating, introspecting, analyzing, etc. Tomáš got a solid competence in deep learning. Tomáš was working on the thesis systematically. We were meeting regularly, Tomáš was always well prepared and was almost always making a great progress. Tomáš was very active and came up with several own ideas. Tomáš is a skilful programmer and he implemented novel inspirations swiftly.

The only weakness I see is that the thesis text would perhaps benefit from another proof-reading. Nevertheless, this is a minor point which does not hinder the outstanding outcome of the effort. For me, it was a pleasure to cooperate with Tomáš. I suggest evaluating the thesis as

A – excellent.

Ing. Jan Čech, Ph.D.
Thesis Advisor