



Thesis Project Form

Title (tentative): Violinist players motion analysis and characterization

Thesis advisor(s): Casadio Maura, Matteo Moro, Francesca Odone (DIBRIS)

E-mail: Maura.Casadio@unige.it

Address: Via Opera Pia 13, 16145 Genova (ITALY)

Phone: (+39) 010 33 52749

Description

Motivation and application domain

The study of motion in violin performances is important for preserving musical heritage, refining techniques and preventing injuries among musicians, contributing to the artistry and sustainability of classical music traditions. Video-based analysis of violinists' motions offers a unique opportunity to delve into the intricacies of musical performance. By capturing and examining their movements, this thesis aims to uncover correlations between technique, posture and musical expression. Understanding these aspects can aid in refining teaching methodologies, preventing injuries and enhancing performance quality among violinists.

General objectives and main activities

The long-term goal of this project is the characterization of violinists motion patterns. In particular, we will explore differences in the characterization performed with a marker-based system and with RGB videos. In order to accomplish this goal, the proposed thesis has different aims:

- the extraction of quantitative parameters (e.g., violin attack angles) that could describe the quality of the motion during the performances;
- the analysis of differences between marker-based and video-based approaches;
- the estimates of violinists' experience from the extracted kinematic parameters.

Training Objectives (technical/analytical tools, experimental methodologies)

The student will learn:

1. Computer vision techniques in order to analyze images and videos;
2. How to use algorithms based on deep learning to estimate the pose of the people in the images;
3. To correlates data;
4. Machine Learning techniques that will allow the clustering and the classification of the data;
5. Improve the knowledge of Matlab.

Place(s) where the thesis work will be carried out: Neurolab, MaLGa Center (DIBRIS) - (optional)Marquette University

Additional information

Maximum number of students: 1

Financial support/scholarship: possibile sholarship for time abroad (Marquette University -USA)