**Title (tentative):** Complex Motor Skill Learning

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### Description

#### Motivation and application domain

Our interest is the impact of previous motor learning solutions on learning a new motor pattern.

#### General objectives and main activities

For example, consider a scenario where you try to implement a new way to write characters in the alphabet while you take notes in class. You can imagine that it would take a great deal of concentration to move the pen in a new pattern. The old movement pattern might re-emerge for months or maybe even years.

The group of participants we plan to recruit for this study is violinists. We are going to provide violinists with violins that have the strings in three different orders and ask them to play a well-known scale. We will test if the order of the strings impacts how quickly the violinists can learn to play the new instrument.

#### Training Objectives (technical/analytical tools, experimental methodologies)

Engineering tasks related to this study include organizing and synchronizing the hardware and software needed for data collection. Kinematic data collection will occur using an infrared 3D motion capture system (OPTOTRAK 3020). Audio signal capture will be performed using a digital audio workstation. Development of the software to collect and analyze the data will be required. Research skills such as methods design, data analysis, and data interpretation will be learned and exercised.

**Place(s) where the thesis work will be carried out:** Marquette University and the Music Institute of Chicago

### Additional information

**Maximum number of students:** 1

**Financial support/scholarship:** Fondo giovani (2018)