Choreography Analysis and Timing

Vision Statement

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**Project goal/scope:**

Dancers of all ages and levels or expertise regularly use mental imagery to better the outcome of their performance. As a part of the study conducted by Dr. Amit Abraham (Department of Physical Therapy, Ariel University) it was demonstrated that mental imagery training improves actual performance. Although the advantages of this type of training, to date there is no system that provides trainees with accurate feedback and that quantitatively assess their level of precision in timing during the mental imagery process (aka chronometry), which is a key element for assessment of the mental imagery training and its beneficial effect.

Our proposed project is designed to answer these gaps by collecting these data that will allow researchers and trainees alike to gain knowledge on precise participants were in the mental imagery process in regard to timing. We will build a platform that will measure and display quantitative outcomes of the mental imagery training.

**High-level features or requirements:**

Our program will include two main ways of performing the training and measurement: Automatic and Manual:

Automatic – the user, on her own, preforms the training given cues by the system.

Manual – the trainee sits with the coach/researcher and preforms the training with a clicker.

**Users:**

Coach/ researcher:

* Select several positions (standing, sitting, eyes opened/closed, break point, times etc.) either at choice or randomly selected.
* Add, edit or remove an exercise. Include adding music(optional), changing length and time of the dance which the gymnast needs to be on point.
* Download an Audio file.
* Adding and remove a gymnast user to the system.
* Download a Log report.

Gymnast:

* Listen to an audio
* Use headphones and a clicker (if required) while training.
* Option of start over without saving the data.

**System**

1. **Training** **(Automatic)** – The user (Olympic gymnast, in our case) will be given an auditory cue ("buzzer”) that signifies the beginning and end of the imaged movement sequence. Next, the user will be imaging the whole movement sequence while given several auditory cues ("beep") to signify agreed-upon points throughout the sequence. That will allow the user to get online feedback about their self-perceived timing precision in comparison to the original timing (e.g., whether the user was accurate with their timing assessment or not). The system will keep track of the number of times the trainee trained.
2. **Assessment (Manual)** – The user will be given the same auditory cue to signify the beginning of the imaged sequence of movements. Then, they will press a clicker (provided with the software) every time they mentally reach each of the agreed-upon points throughout the movement sequence. The program will record and save the exact time (millisecond-level precision) the user clicked and compare it to the pre-programmed desired time. At the end, the user will be able check if they were accurate with their judgement, and to what degree.
3. **Audio File –** The user will be able to create an audio file as a part of the training defined in section 1 and the gymnasts will be able to use it.
4. **Log report –** The user(coach/researcher) will be able to download a report log/graph that shows the training statistics for each gymnast or all and makes a comparison between them.
5. **Multi player –** The system will have the option for two gymnasts to train simultaneously according to the way of training defined in section 2.

**Milestones:**

* Create a full detailed plan with the main goals of the project and coordinating expectations.
* Create a web application in JavaScript
* Design and implement a data storage using firebase.
* Perform a set of field experiment
* Complete the website, by incorporating the incites raised by the experiments. Complete the website including an efficient and easy platform to store and analyze the data.

**Summary:**

For gymnasts and dancers of all levels of expertise who want to include mental imagery training as part of their physical practice, this platform will help them train in a more efficient and comprehensive way. Unlike the methods used today, our platform will give the trainees online feedback for cognitive functions. This will overall eliminate the dependence gymnasts and dancers have in their trainers to make sure they are precise.

**References:**

* The article “השימוש בדימויים ככלי לשיפור ביצועים ומניעת פציעות במחול” by Dr. Amit Abraham

https://meyda.education.gov.il/files/Mazkirut\_Pedagogit/mafmarmahol/maagarim/AvrahamAmitDanceNow.pdf