~~Links-/Rechtshänder erkennen an Bewegungen??, Sachen mit linker und rechter Hand ausprobieren und dann „Selbstsicherheit“ analysieren, oder Sachen machen lassen und schauen, welche Hand genutzt wird (zu wenig MC), es müssten so einfache Übungen sein, dass sie mit beiden Händen erledigbar sind, Vorzeigen, nachmachen, vllt mehrfach durchführen, veränderungen anzeigen??, wird man besser?, wie sehr nähert man sich der „guten“ Seite an~~

Sachen im Raum anordnen, Stapeln?, irgendwohin stellen, etwas malen,

Sachen versuchen regelmäßig zu machen mit/ohne Musik, mit verschiedenen Arten von Musik

~~Tischtennisball mit Schläger hochhalten~~

Irgendwelche Gleichgewichtsübungen (L/R Bein, auf einem Bein stehen)

How much does music disturb one in holding a walking rhythm

Does listening to music change a behaviour

With Which kind of music it is easier to follow the walking rhythm, wie sehr ist man an die Musik gewöhnt?

Does the expression change with different types of music

Metronome, how long does it need to synchronize with new music?

André Novak (01601797):

I want to examine how long the participants need to align their walking to a music rhythm and how well they can keep it. The participants are asked to walk in a self-chosen specific walking rhythm. Then they are confronted with different types of music:

* Hector Berlioz – Symphonie Fantastique, 4. Movement ([Link](https://www.youtube.com/watch?v=sdYRYbjCcJg&t=2300s), 38:20-38:38)
* Rare Earth – Big John is my Name ([Link](https://youtu.be/C2RtDp9RTsU?feature=shared&t=36), 0:36-0:56)
* The Wombats – Greek Tragedy ([Link](https://www.youtube.com/watch?v=9MHmx9nvHqU&t=27s), 0:27-0:48)

The task is to align the walking rhythm to the music. Comparing the alignment capability of the participants to these different types of music I want to examine how synchronisation to music changes with different types of music genres.

For this, markers will be positioned on the toes and heels to capture the walking rhythm. As people use their hands and arms for walking as well, markers will be placed there too.

If needed, I can be later at the MediaLab to perform the recordings.

defining what we want to measure, visualizing (boxplot, diagramms,...)

and how to quantify it

comparison between people

or description of what happens

check on average how well people adapt to music

different types of beat

beat tracking of 20seconds of music

with **sonic visualizer** plugins, oder tap beat with hand

beat tracker plugins (vamp)

gives beat and average tempo of music

people twice the tempo

times values later paste data (link to youtube sended by mr Mühlhans)

export annotation layer

do the same with a step from MC-DATA, combine (two foots, L/R)

what is a step, close to zero in Z, when velocity in near 0

velocity mm/s

biggest problem – how to define a step, in data

also possible with max. velocity

magnitude of velocity, or Z axis

how many steps per time unit

why z in some cases higher/lower

average tempo between the music and comparing these

steps per minute as average value and curve is interesting

1 Schritt Ferse Z unten

Abstract: 300-500w (including references), Style Apa7

*André Novak (016017979) – UE Motion Capture - Quantifying human motion and posture (2023W)*

**Abstract**

**Music Makes You Move: Analysing Music-Induced Walking Rhythms**

Music has the feature to make humans move. The beat of the music forces people to move to it, whether it is free and spontaneous or more coordinated (Burger, et al. 2014, p. 1). While many studies focus on the freely music-induced movements (Burger, et al., 2012 or Eerola, et al., 2006) only few are focussing on walking rhythm induced by music beats. Styns, et al. (2007) analysed walking rhythm alignment to music and found out that synchronization nearly always happens. Even if people had a hard time synchronizing to the music it always had an impact on their walking tempo. They used GPS devices to track the walking speed.

I wanted to take another approach measuring this phenomenon. Using a motion capture setting, I examined how well the participants can align their walking rhythm to different styles of music and how well they could keep it and how long they needed to align. The different music examples (detailed below) were chosen due to their different styles. This makes a comparison between different music genres possible.

For the recording, the six students and the leader of the course “UE Motion Capture - Quantifying human motion and posture (2023W)” at the University of Vienna were asked to find their own walking rhythm for 20 seconds and were then confronted with 3 clips of music (each around 20 seconds long) with 5 seconds silence in between. They were asked to adapt their walking rhythm to each piece of music.

The recording of the experiment took place at the MediaLab of the Faculty of Philological and Cultural Studies at the University of Vienna. Software and cameras from the company “Qualisys” were used for the marker-based recording. (MediaLab, 2023) The framerate was 100 frames per second. Markers which were placed on each heel were chosen for the analysis. Therefore, I defined a step as the position where the value for the Z-axis of each heel reaches its lowest point during regularly movements. For the processing of the captured data, I used the software “Qualisys Track Manager”. For the beat tracking of the music clips, I used “Sonic Visualizer and its plugin “INESC Beat Tracker”. The analysis I carried out using a Python-script.

The first results of the analysis show that the alignment capability varies between the participants. While some had less problems aligning to all music clips, others had hard times especially with the classical piece. Therefore, it can be said that the alignment to the pop music clips was easier than to the classical one. Especially finding the rhythm for the first music clip was harder than to the last one. When the rhythm was found, it was easiest to keep it with the last music clip.

For such an examination it must be said that the participants were watching each other doing the recording. In this setting they all could get to know the music while watching. I was also part of the participants (already knowing the music) so the results of the 4th participant were analysed considering this. In more extensive research, each participant should do the task on their own without watching the others. The music clips could be chosen more systematic to include more styles and different BPM-rates to get a broader view on rhythm alignment capabilities to different types of music.

Keywords: Motion Capture, Music, Walking, Beat tracking, Rhythm Alignment

Listing of music clips:

* Rare Earth – Thema. (2018, July 26). Big John Is My Name [Video]. YouTube. <https://youtu.be/C2RtDp9RTsU?feature=shared&t=36> (0:36-0:56)
* hr-Sinfonieorchester – Frankfurt Radio Symphony. (2021, October 05). Berlioz: Symphonie fantastique ∙ hr-Sinfonieorchester ∙ Alain Altinoglu [Video]. YouTube. <https://www.youtube.com/watch?v=sdYRYbjCcJg&t=2300s> (38:20-38:38)
* The Wombats. (2015, January 15). The Wombats - Greek Tragedy (Official Video) [Video]. YouTube. <https://www.youtube.com/watch?v=9MHmx9nvHqU&t=27s>, (0:27-0:48)

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