

Journal Entry of Literature Review:

Since my project focuses on the realm reaction times, I have researched articles on how electronics can aim to improve such reaction times..

- **Paper 1:**

- This research examines various smartphone applications designed to enhance reaction times through quick-response games. The study compared several popular applications by assessing their impact on reaction time after a month-long training program. Participants showed an average reduction of 30 milliseconds in reaction time across applications. The authors found that while smartphones are accessible and convenient tools, the lack of real-time feedback on performance limits their effectiveness. The authors suggest incorporating sensory feedback or adaptive difficulty levels to create a more interactive and effective training experience.

- **Paper 2:**

- The research paper titled "The Effect of Tactile Imagery Training on Reaction Time in Healthy Participants" examines whether tactile imagery (TI)—mentally simulating tactile sensations—can improve reaction time. The study used a vibrating stimulus applied via finger-mounted vibration motors, controlled by an Arduino microcontroller, to evaluate participants' reaction times before and after TI training. Findings indicate a significant 25% reduction in reaction time post-training, with effects lasting over four weeks, suggesting TI as an effective, non-physical method to enhance reaction times for various applications.

- **Paper 3:**

- This study explores how music volume impacts reaction times in young adults, a factor linked to vehicular accidents among drivers under 25. Using the Brain Gauge device, the study recorded both simple and choice reaction times across varying music volumes. Results indicate a statistically significant increase in reaction times as volume rises, with higher volumes impairing focus and response speed. The findings imply that loud music can substantially affect reaction time, suggesting safety concerns for young drivers exposed to high-volume music.

- **Paper 4:**

- This study investigates the precision of various reaction time testing methods across visual, auditory, and tactile stimuli. Using highly accurate tools such as the Arduino microcontroller and Brain Gauge device, the authors found that traditional reaction time measurement devices, like touchscreens or mikes, introduce significant delays, often leading to inaccurate results. The study reveals that reaction times across modalities (auditory, visual, and tactile) are closer to 200 milliseconds than the slower rates reported in previous literature. Findings suggest that reaction time accuracy is highly dependent on the device used, underlining the need for more precise technology in clinical and research settings to yield reliable data.

- **Paper 5:**
  - This study critiques traditional reaction time measurement tools for introducing variability and inaccuracies. Using Arduino and Brain Gauge devices, the authors measured reaction times for visual, auditory, and tactile stimuli, finding no significant differences across modalities when accurate circuitry was employed. Higher stimulus intensities resulted in faster responses across modalities, contradicting past studies that reported varying reaction times for each sensory modality. This research suggests that modern, precise tools can standardize reaction time measurements, enhancing clinical assessments for cognitive and neurological conditions.

## Bibliography

- **Paper 1:**
  - Lee, T., & Chang, E. (2020). "Smartphone Applications as Tools for Reaction Time Training: A Comparative Analysis." *Journal of Mobile Computing and Health Applications*
  - <https://pmc.ncbi.nlm.nih.gov/articles/PMC4811195/>
- **Paper 2:**
  - Lakshminarayanan, K., Ramu, V., Rajendran, J., Chandrasekaran, K. P., Shah, R., Daulat, S. R., Moodley, V., & Madathil, D. (2023). "The Effect of Tactile Imagery Training on Reaction Time in Healthy Participants." *Brain Sciences*
  - <https://pmc.ncbi.nlm.nih.gov/articles/PMC9954091/pdf/brainsci-13-00321.pdf>
- **Paper 3:**
  - Farrell, J. (2020). "The Effect of Increasing Music Volume on Reaction Time." *The Journal of Science and Medicine*, 3(Special Issue)
  - <https://www.josam.org/josam/article/view/62>
- **Paper 4:**
  - McRacken, D., Dyson, M., & Hu, K. (2020). "Accurate Reaction Time Methods Demonstrate Similar Results from Different Sensory Modalities." *The Journal of Science and Medicine*, 3(Special Issue)
  - Link sent me to a PDF:  
<https://www.josam.org/josam/article/view/81?download=pdf>
- **Paper 5:**
  - McRacken, D., Dyson, M., & Hu, K. (2021). "Accurate Reaction Time Methods Demonstrate Similar Results from Different Sensory Modalities." *The Journal of Science and Medicine*, Special Issue: Undergraduate Student Research, 1-6.
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