

EXPLORING THE CEREBRAL ACTIVITY THROUGH MUSIC AND VISUALS.

SANDRA GOMEZ VILLAREAL, HÈCTOR TRUJILLO RUIZ

Mater of Digital arts and creative technologies
Digital arts and creative technology
La sede
Universitat Ramon Llull

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SUMMARY

SUMARIO

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INTRODUCTION

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THEORY

2.1 visual cortex

The region of the brain that is in charge of receiving, processing and interpretate the information that arrives trough our eyes is called visual region. The main structure for that is the visual cortex, placed on the back of the brain, in the occipital lobe.

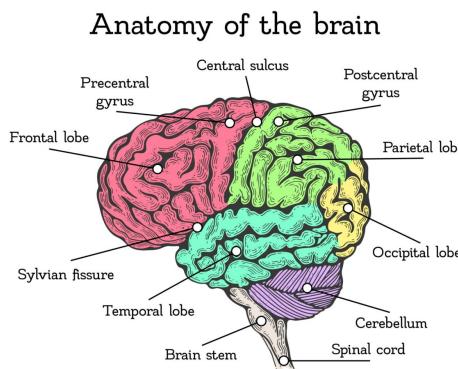


Figure 1: Areas of the brain

The light enters trough the eyes going trough the retina. In the retina, there are special cells (cones and rods) that transform the light into electrical signals. Those signals travel through the optic nerve to a station called the thalamus (specifically to the lateral geniculate nucleus).

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CONCLUSIONS

3.1 conclusions

BIBLIOGRAPHY

- [1] Marc Arnela, Romain Blandin, Saba Dabbaghchian, Oriol Guasch, Francesc Alías, Xavier Pelorson, Annemie Van Hirtum, and Olov Engwall. "Influence of lips on the production of vowels based on finite element simulations and experiments." In: *The Journal of the Acoustical Society of America* 139.5 (2016), pp. 2852–2859.
- [2] Marc Arnela, Dabbaghchian Dabbaghchian, Blandin Blandin, Oriol Guasch, Olof Engwall, Arnaud Van Hirtum, and Xavier Pelorson. "Effects of glottal opening on the phonation using a two-mass model coupled to a waveguide." In: *The Journal of the Acoustical Society of America* 140.3 (2016), pp. 1707–1718.
- [3] Atlas Sound. *PD-5VH Compression Driver*. Accessed: 2024-08-28. 2023. URL: <https://www.atlasied.com/pd-5vh>.
- [4] Ana Barjau. *Acústica y Vibraciones*. Archivo PDF. 2020. Chap. 12.
- [5] Davius. *First and second formant of Spanish vowels from Bradlow*. 2011. URL: https://commons.wikimedia.org/wiki/File:Spanish_Vowel_Formants_Bradlow1995.png.
- [6] SoundDevice Developers. *Python SoundDevice Documentation*. Accessed: 2024-05-09. 2024. URL: <https://python-sounddevice.readthedocs.io/en/0.4.7/>.
- [7] MCM Electronics. *53-1211 Tweeter*. Accessed: 2024-08-29. 2024. URL: https://MCM%20ELECTRONICS/MCM%20ELECTRONICS/53-1211?srsltid=AfmB0opTwkUyFe2MbFung2pMXyhf6Aox0evN0mnsYGT-W5QgUZ_ZHRk&redirect=true.
- [8] Eminence. *PSD 2002S*. Accessed: 2024-08-28. URL: <https://eminence.com.mx/psd-2002s.html>.
- [9] Gunnar Fant. "The source filter concept in voice production." In: *STL-QPSR* 22.1 (1981), pp. 021–037. URL: <https://doi.org/10.1080/14706881.1981.9693572>.
- [10] Begonya Torres Gallardo. *Anatomía Funcional de la Voz*. Epistemus, 2008. Chap. 1.

- [11] Monacor International. *KU-516*. Accessed: 2024-08-28. 2024.
URL: <https://www.monacor.com/products/pa-technology/speakers-/horn-speakers/low-impedance--/ku-516/>.
- [12] Daniel Jones. *Daniel Jones and 18 Basic Vowels*. PDF Document. Task Sheet: Linguistics D, October 24, 2021. 2021.
URL: <https://example.com/yamagen/ling/ling-jones-single2021.pdf>.
- [13] Pyle USA. *PDS 221 - Midrange/Tweeter Compression Horn Driver*. Accessed: 2024-08-28. 2024. URL: <https://pyleusa.com/products/pds221?variant=40212290535459>.