

PROCESSING OF ARDUINO-CONTROLLED VALVOMETRY DATA FOR MUSSEL RAFT AND LABORATORY MONITORING

ForoAcui

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STRAUSS

MoMENTO

redeira

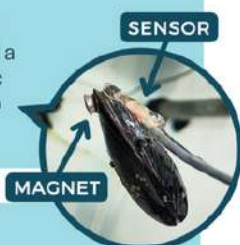


What is valvometry equipment?

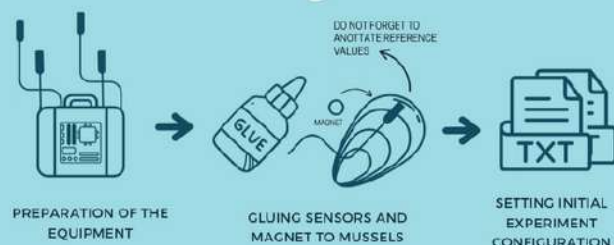
Valvometry equipment is a High-Frequency (10 Hertz), Non-Invasive (HFNI) instrument used as a biosensor to assess the gaping behavior (valve opening and closure) of bivalve molluscs [1].

Gaping activity of many bivalve species is closely related to physiological processes such as nutrition, respiration, and waste elimination, which respond to environmental conditions following rhythmic cycles. Bivalves alter their normal gaping behavior in the presence of stressors, indicating environmental perturbations, allowing us to use this response and this technology for marine monitoring and assessment [1].

The principle behind the use of these (bio)sensors involves gluing a Hall-effect sensor to one valve and a magnet to the other. The intensity of the magnetic field detected by the sensor changes according to the distance between the two valves.



How do we get the data?



For more details about the process of getting Valvometry data and technical details about the lab/raft equipments see Gilcoto et al. (2021) [2] and Gilcoto et al. (2023) [3]



LAB VALVOMETRY EQUIPMENT



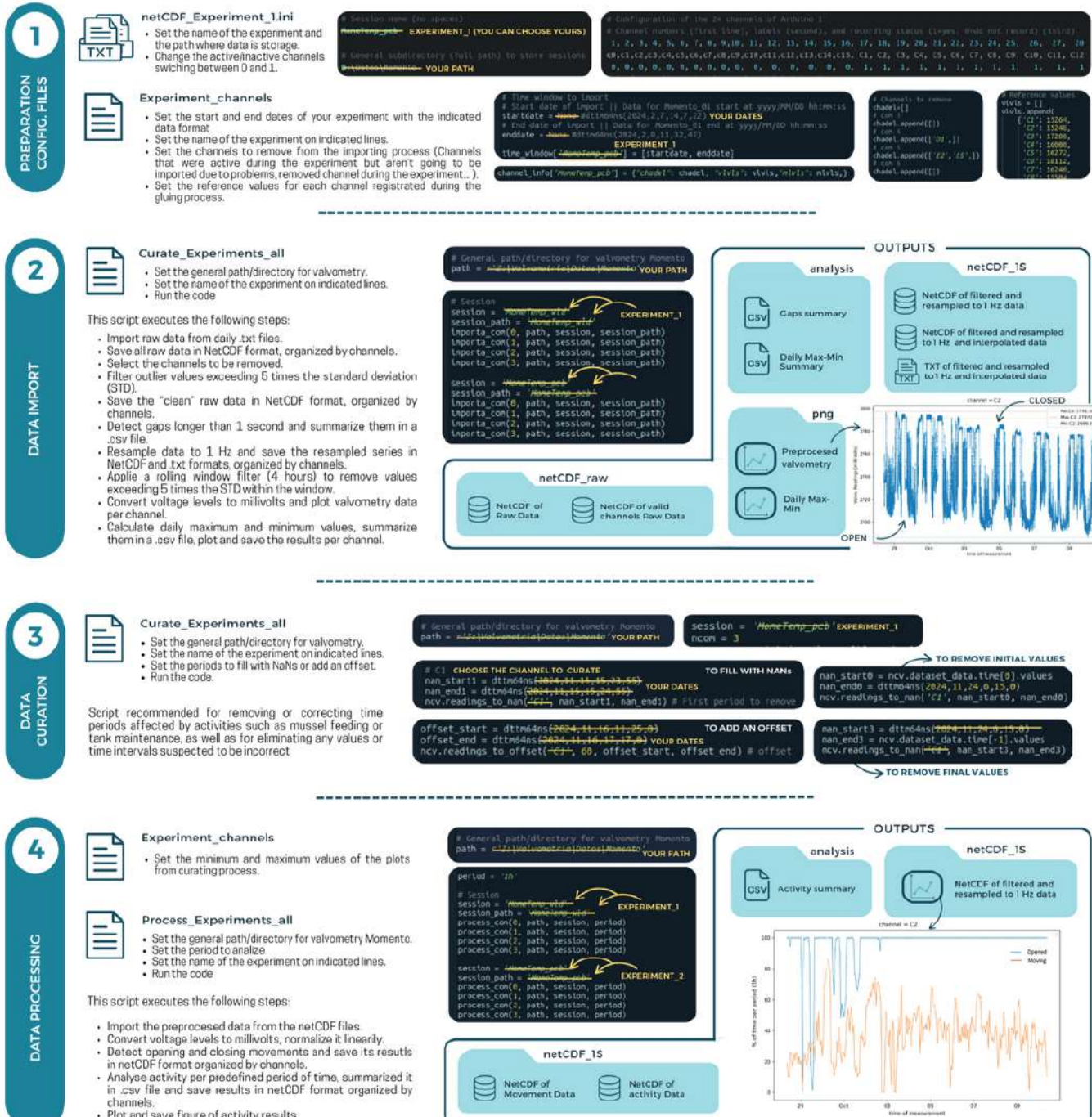
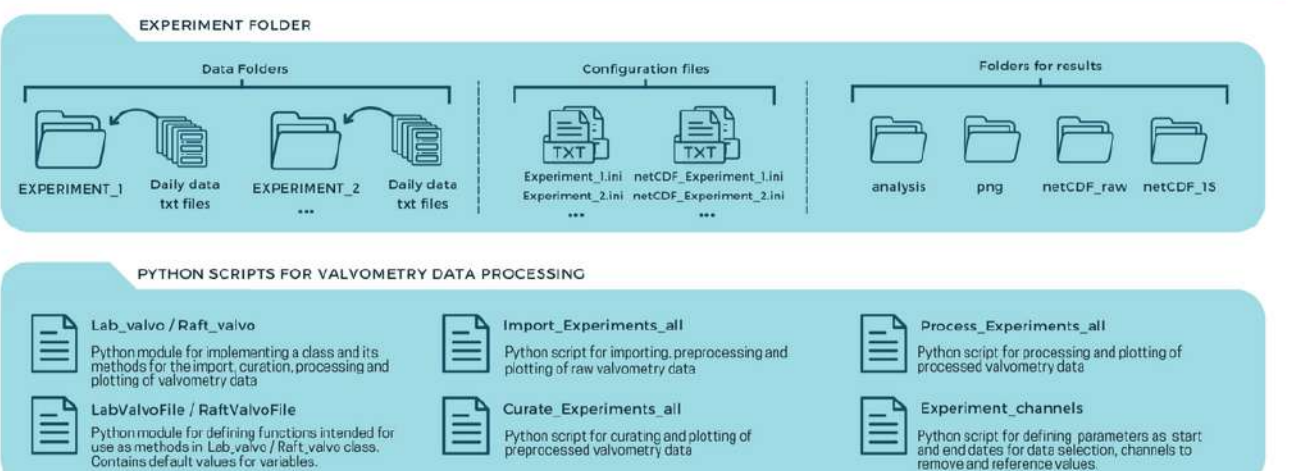
RAFT VALVOMETRY EQUIPMENT

Take-home message

Data acquisition and processing were developed with open hardware, opensource software and userfriendly code, with shareable results in NetCDF format in accordance with FAIR principles. The code will soon be publicly available in DIGITAL.CSIC and other public repositories. This technology contributes to early warning systems and to less invasive animal monitoring.

[1] Andrade, H., Massabuau, J.C., Cochran, S., Cret, P., 527 Tran, D., Sow, S., and Camus, L., "High Frequency Non-Invasive (HFNI) Bio-Sensors As a Potential Tool for Marine Monitoring and Assessments", Front. Mar. Sci. vol. 8, pp. 137, 2021, doi: 10.3389/fmars.2021.6.00187
[2] Gilcoto, M., W. Redondo-Caride, E. Silva, A. Velo, L. A. Comeau, R. Figueira, and J. M. F. Babarro (2021), Arduino controlled valvometry equipment for laboratory monitoring, Instrumentation Viewpoint, 21.9th Marine International Workshop on Marine Technology (MARTECH21), 60-61.
[3] Gilcoto, M., W. Redondo Caride, A. L. Velo, L. A. Comeau, R. Figueira, and J. M. F. Babarro (2023), Arduino controlled valvometry equipment for mussel raft monitoring, Instrumentation Viewpoint, 22.10th International Workshop on Marine Technology (MARTECH2023), 43-44.

Data processing workflow



Acknowledgments

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