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On Time and Control Theory: An Engineering Approach

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SUMMARY

By following a quasi-chronological order, the purpose of this talk is to expose how the concepts of time and the ways of measuring and using it are reflected in some of the developments of the Control Theory from its origins to the present day. We will explore issues such as the advent and development of pendulum clocks and their contributions to automatic control, the search for the minimum time and the origins of optimal control, the birth of the control theory with the calculus and the Newtonian concept of time, the relations between sampling, integral sums and the relational concept of time defended by Leibniz, or the concept of time reversibility and its influence on dynamical systems. Finally, we will give some insights about the role of time in PID control, the relation of feedback with memory and time, and some considerations on time for Artificial Intelligence.

Keywords: control theory, time

AMS Classification: 93, 01, 49

References

[1] Blas M. Vinagre. *Time in Control Theory: On Concepts, Measures and Uses.* Springer, 2024.

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