Kalman Filter Applied to an Arduino DAQ for a Temperature Control System

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Abstract—**Precise temperature surveillance is indispensable across a myriad of everyday and industrial contexts. To tackle this challenge, this paper delves into the exploration of employing a Kalman filter to proficiently attenuate noise in the measured parameter.**

For this endeavor, an Arduino DAQ was implemented for temperature measurement. Voltage reading were obtained using the Simulink's analog output block and subsequently converted to temperature units through a MATLAB function. Subsequently, the Kalman filter was applied to mitigate the signal noise.

Keywords—**Arduino, Control System, Kalman Filter, Matlab, Simulink, Temperature**

I. INTRODUCTION

In previous research [1], the significance of the heating or temperature control systems across a range of industries including biology, biotechnology, food supply chain, transportation, automotive, agriculture, buildings, and beyond was examined. During the prior study, the methodology was focused on modeling the heating system and implementing a least-squares filter using Simulink. For this work, the approach is centered on the Kalman filter applied to an Arduino DAQ system for a temperature control system.

I-A. Kalman Filter

[2]

II. METHODOLOGY

III. RESULTS AND DISCUSSION

IV. CONCLUSIONS

REFERENCES

[1] E. A. Obregon Fonseca, "Least-Squares Filter Applied to a Temperature Control System using Simulink," 2024, unpublished.

[2] J. M. Mendel, *Lessons in estimation theory for signal processing, communications, and control*. Pearson Education, 1995.