CD++ Model Data Form

Title: Smart Fridge Temperature Control System

Type [DEVS Model, Cell-DEVS Model, Tool]: DEVS Model

Acronym/Short name: DEVS Model

Purpose for which Developed: Developed as a course project for DEVS Modeling and Simulation to model, implement, and validate a hierarchical smart fridge temperature control system with hysteresis-based ON/OFF control using Cadmium.

Other Applications for which it is Suitable: Suitable for teaching and demonstrating closed-loop DEVS control systems, hysteresis-based regulation, event-driven sensing/actuation, and incremental validation of atomic and coupled DEVS models.

Date Developed/Implemented: February 2026

Domain: Control Systems

Current Version: 1.0

URL: https://github.com/maryambazyari/smart-fridge-temperature-control-devs.git

Description (including characteristics):   A hierarchical DEVS model of a smart fridge temperature control system composed of three atomic models (TempSensor, Controller, Compressor) and coupled models (FridgeControlService and SmartFridgeSystem). The model implements periodic temperature sensing, hysteresis-based ON/OFF control, compressor feedback, and event-driven closed-loop behavior. It was implemented in C++ using Cadmium and validated through simulation traces showing bounded temperature oscillation and correct command/status feedback.

Links to Related Documents

Short Title: Project Report (Smart Fridge DEVS)

URL: https://github.com/maryambazyari/smart-fridge-temperature-control-devs.git

Description: Course project report including conceptual model, formal DEVS specification, pseudocode, DEVS-Graph diagrams, Cadmium implementation details, and simulation validation results.

Keywords: DEVS, Cadmium, smart fridge, temperature control, hysteresis control, discrete-event simulation

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Comments: This model was developed for academic use in a DEVS modeling course. The implementation includes atomic and coupled DEVS models in Cadmium, DEVS-Graph design artifacts, and simulation traces demonstrating correct hysteresis-based regulation behavior.