Real-Time Scheduling of Adaptive Variable Rate (AVR) Tasks for Engine Control

Control-Flow Level Techniques for Minimization of Cache-Related Preemption Delay for Sequential and Parallel Real-Time Tasks

Thermal Resilient Real-Time System Design

Autonomous Battery Operating System Design

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Task invoked at specific crank angle locations:
AVR–TASK( int rpm ){ f1(); 
if (rpm < 3000){ f2 ( ); } 
else if (rpm > 6000){ f3 ( ) ;} 
f4 ( ) ;
}

Task Execution Time: dependent upon physical variable (e.g., RPM).

Task Deadline: crankshaft revolutions.

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Autonomous Battery Operating System Design

Power Grid/Supplier
Device (EV)/User
External Environment/Threats

ABOS
Battery-Aware Routing/Charging
Threat/Fault Protection
Battery/User-Behavior Estimation

BMS
Physical Multi-Cell Battery

Battery-Aware
Routing/Charging
Threat/Fault
Protection
Battery/User-Behavior Estimation

Physical-Level
BMS
Modules
Monitoring
Cell Balancing
Charge/Discharge
...