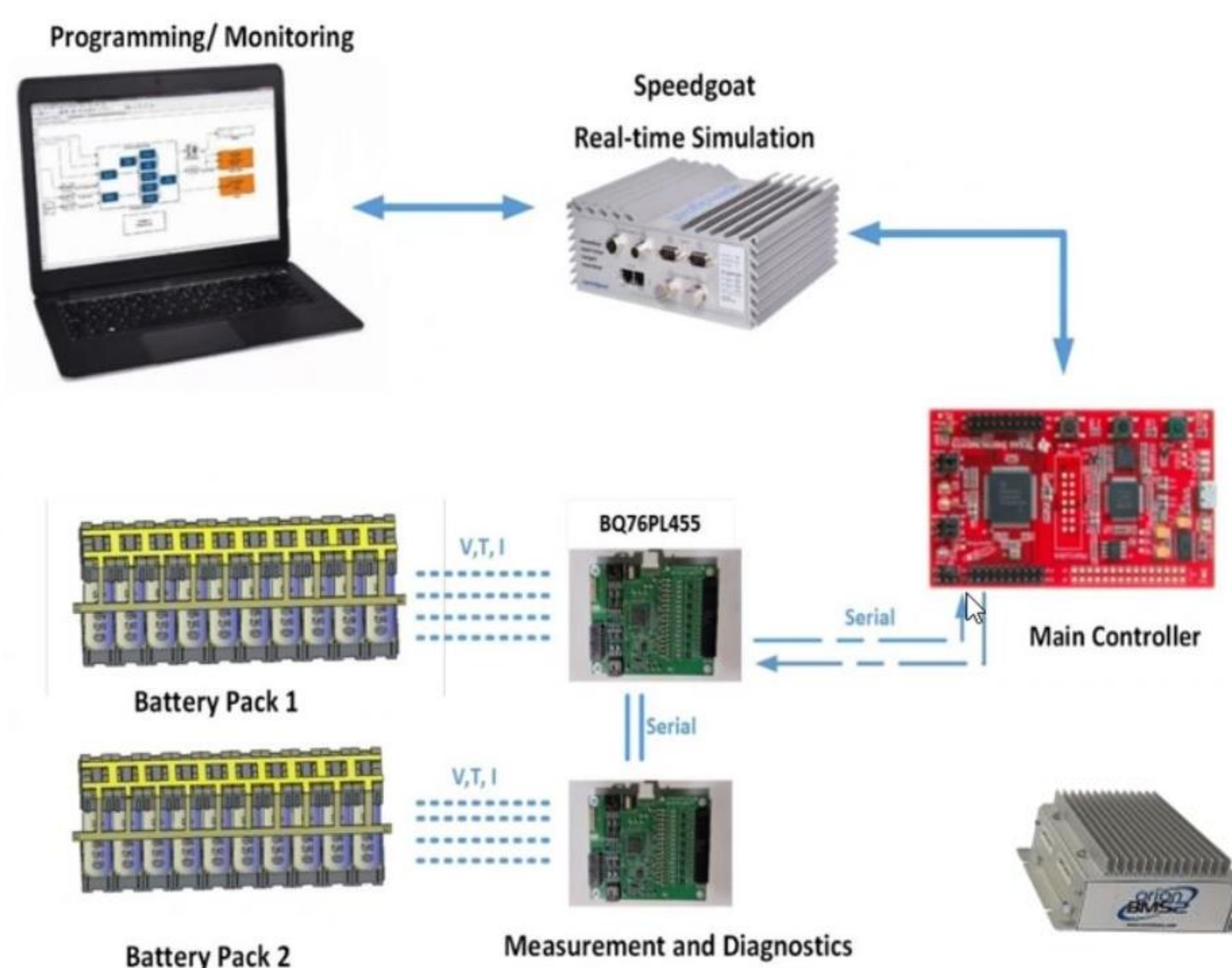


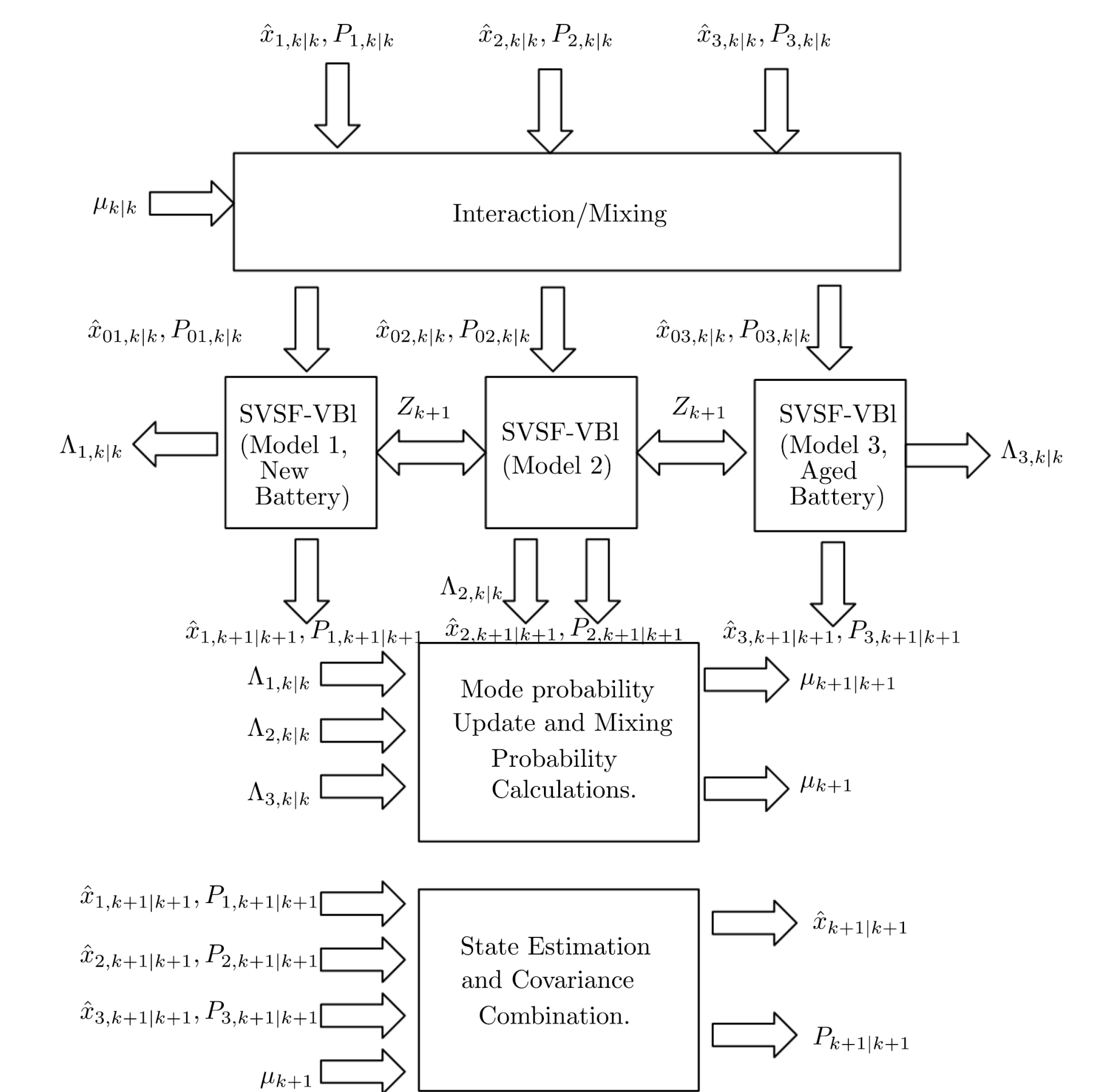
System Design



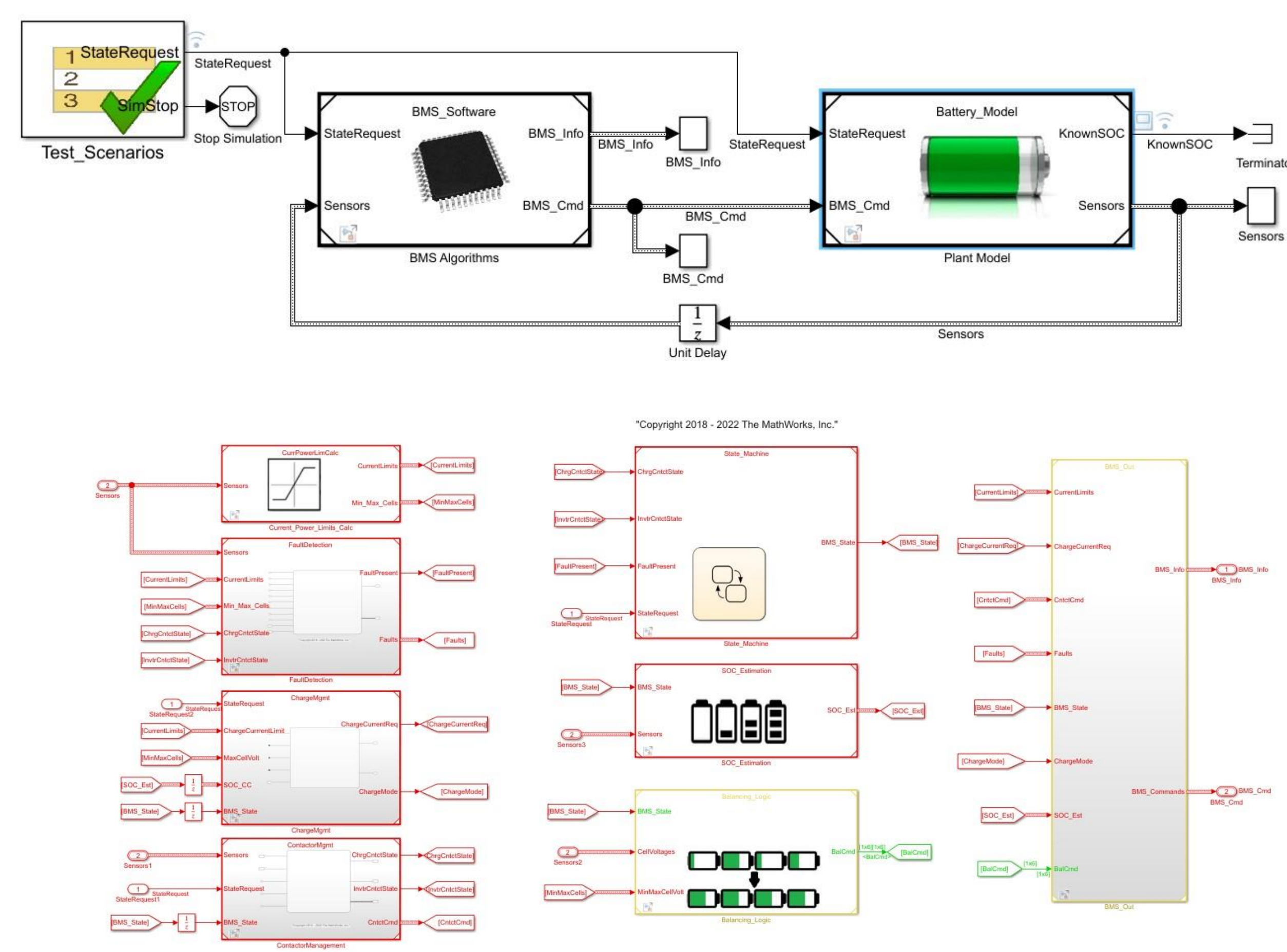
State Estimation

- BMS software implementation
 - Multiple battery packs
 - Different cell chemistries
- Accurate estimation
 - SoC, SoH, and SoP
 - SoC estimation error < 1%
- Robustness
 - Physical changes (aging)
 - Disturbance and noise
- Real-time application
 - MATLAB/Simulink
 - Speedgoat

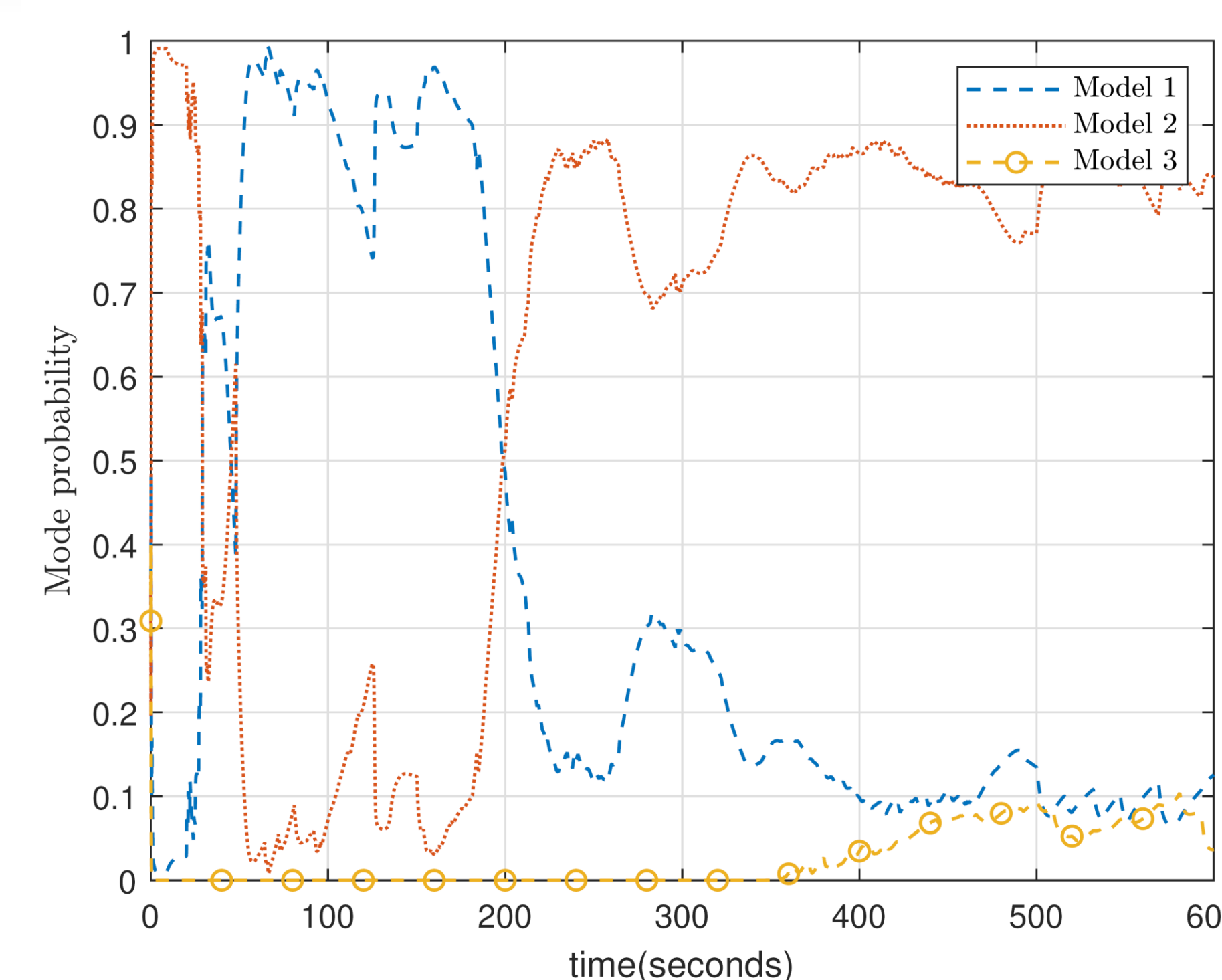
IMM-SVSF Algorithm



Software Implementation



Mode Probability



S. Rahimifard, R. Ahmed, and S. Habibi, "Interacting Multiple Model Strategy for Electric Vehicle Batteries State of Charge/Health/Power Estimation," *IEEE Access*, vol. 9, pp. 109875-109888, 2021.

S. Rahimifard, S. Habibi, G. Goward, and J. Tjong, "Adaptive Smooth Variable Structure Filter Strategy for State Estimation of Electric Vehicle Batteries," *Energies*, vol. 14, no. 24: 8560, 2021.

Estimation Accuracy

