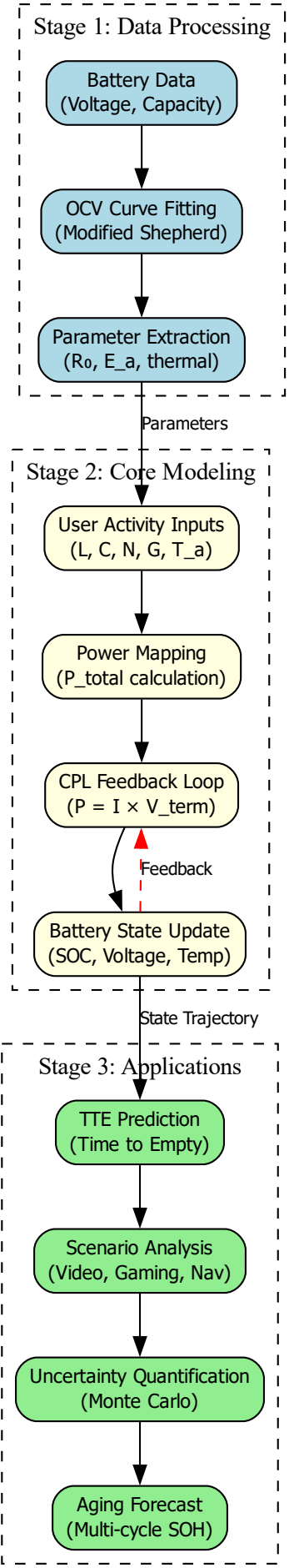
Stage 1: Data Processing
Battery Data
(Voltage, Capacity)
OCV Curve Fitting
(Modified Shepherd)
Parameter Extraction
(R₀, E_a, thermal)
Parameters
Stage 2: Core Modeling
User Activity Inputs
(L, C, N, G, T_a)
Power Mapping
(P_total calculation)
CPL Feedback Loop
(P = I × V_term)
Feedback
Battery State Update
(SOC, Voltage, Temp)
State Trajectory
Stage 3: Applications
TTE Prediction
(Time to Empty)
Scenario Analysis
(Video, Gaming, Nav)
Uncertainty Quantification
(Monte Carlo)
Aging Forecast
(Multi-cycle SOH)