The PACC* Starter Kit is an integrated set of tools that demonstrates how technologies can be combined to deliver objective confidence in predictions of system behavior.

Constructive Features
- Design language (UML statecharts + component wiring)
- Code generation
- Execution environment – Pin component technology – RTOS real-time extensions
- Measurement tools – Performance – Memory use

Analytic Features
- Performance – Worst-case latency – Average-case latency – Sporadic-server latency
- Behavior – Based on software model checking – Proof generation on success
- Security – Buffer overflow detection – Memory consumption

Objective confidence in predictions requires
- Sound theories and models
- Confidence in the relationship between models and code

Performance Analysis
The Performance reasoning framework uses sound performance theories and simulation techniques to predict average- and worst-case response times of a component-based application. Analysis is done in two automated steps:
- Design specification is transformed into a performance model.
- The performance model is evaluated by different kinds of evaluation procedures:
  - Closed formula (e.g., Rate Monotonic Analysis)
  - Discrete-event simulation

Statistical evidence provides objective confidence in predictions.

Behavior Analysis
The Behavior Analysis reasoning framework uses software model checking to verify user-defined claims regarding software behavior. When a behavior claim does not hold, a counterexample is produced.
- Complete execution trace leading to the failure
- Trace summarized in a sequence diagram

When a behavior claim holds, a certified binary can be generated.
- Certifying model checking techniques generate invariants from which a proof is constructed.
- Proof-carrying code techniques are used to embed the proof in the binary.

Performance Measurement
- Allows measurement of
  - Event interarrival time
  - Latency
  - Component execution time
- Provides the data needed for performance predictions
- Allows validating the prediction against measured observations

Audio Examples
The PACC Starter Kit includes a library of audio components to build examples.
- WAV decoder
- Tone generator
- PCM player and display
- Audio processing components: adder, subtractor, inverter, gain, delay, switch

Statistical evidence provides objective confidence in predictions.