CPS: Small: Reconciling Safety with the Internet for Cyber-Physical Systems

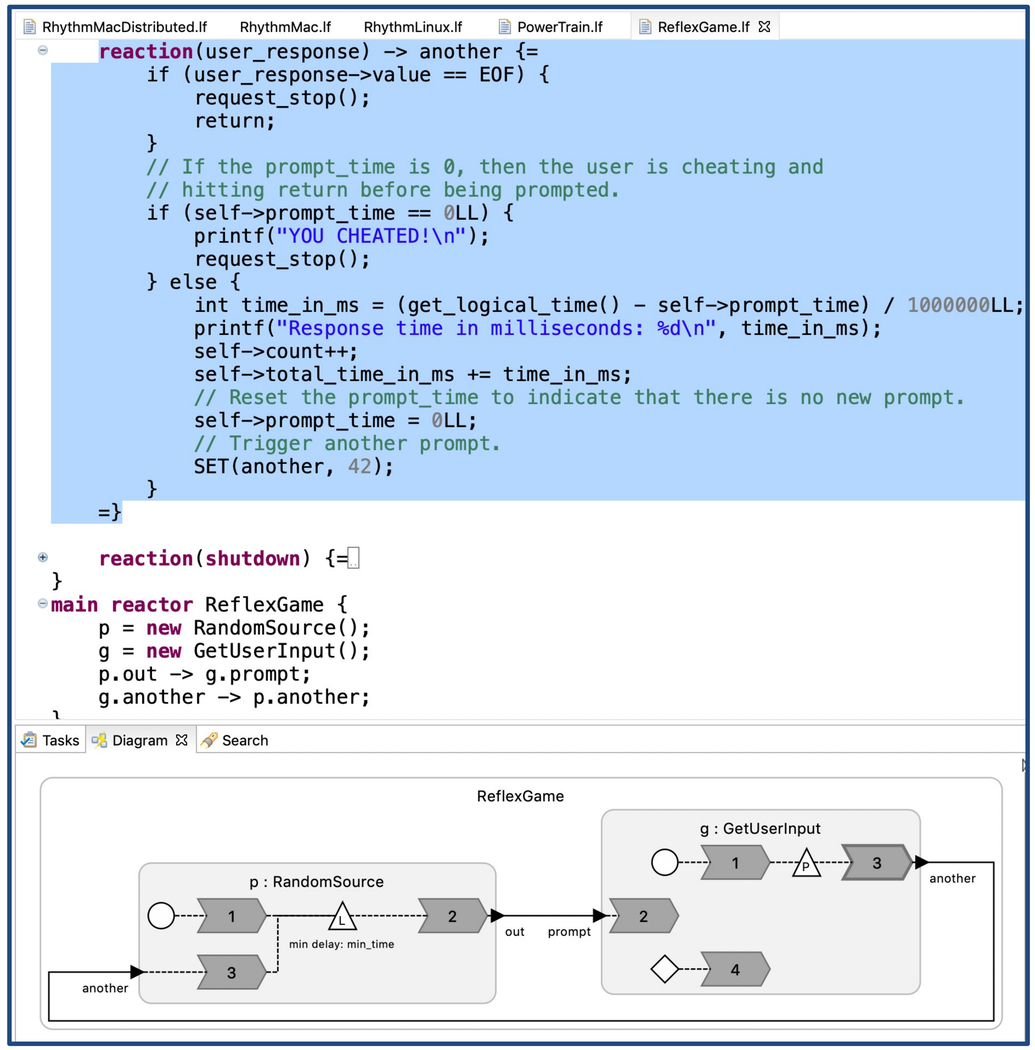
Challenge:

Timing of software and ordering of actions in CPS designs is difficult to control and leads to nondeterminism and untestable systems.

Solution:

Lingua Franca is a polyglot language for connecting software components in real-time, concurrent, and distributed systems.

PI: Edward A. Lee, UC Berkeley, #1836601, 10/18-9/21



Portion of the Lingua Franca IDE with a simple interactive, real-time test case that combines several features of the language.

Scientific Impact:

Lingua Franca coordination and scheduling of components will replace nondeterministic ad-hoc techniques in ROS, MQTT, SoAs, and actors.

Broader Impact:

This project represents a commitment to deterministic models and testable systems. Generated code runs on multiple platforms, including in some cases bare iron embedded processors.