Rumoca
User Group Meeting

WHEN
Wed, Nov 18
6:00–7:45 PM

WHERE
ARMS 1010
Armstrong Hall

FOOD
Pizza
Please RSVP

SCAN TO RSVP
forms.gle/n6sf5KCtxTJd1xmv9

Demos, roadmap and open hacking for users and contributors. **Bring a model. Bring your agent.**

WHY RUMOCA

Your entire robot stack. One math problem.

Rumoca unifies dynamics, estimation, control, learning and safety into one abstract mathematical problem, then solves and deploys it optimally for your hardware, in an agent-native framework.

pendulum.mo — written by your agent

```
model Pendulum
  parameter Real g = 9.81;
  parameter Real L = 1.0;
  Real theta(start = 0.5);
  Real omega;
equation
  der(theta) = omega;
  der(omega) = -g/L*sin(theta);
end Pendulum;
```

rumoca · Rust-native Modelica compiler

→

Machine learning & RL
Train RL policies against the same physics.

Optimization & controls
Design controllers and trajectories from one model.

Simulation, SITL & HIL
Native or WebAssembly speed, software to hardware.

Verification
Lean proofs and reachability for provable safety.

MODEL TO MICROCONTROLLER

Export controllers to embedded C, already flown on a real fixed-wing aircraft.

PLAYS WELL WITH OTHERS

Generates C, Rust, Python (JAX, CasADi) and FMI, or any target you template.

USED IN INDUSTRY AND ACADEMIA

PURDUE UNIVERSITY · NXP

ALREADY RUNNING

Scan to try live demos compiled by Rumoca, right in your browser.

SLAM Lab
Browser robotics

Microduck
A walking robot

Find Rumoca on GitHub · github.com/CogniPilot/rumoca
Join CogniPilot on Discord · discord.com/invite/cognipilot

Open source, started at Purdue · part of CogniPilot