



# Software State Observability in CPS

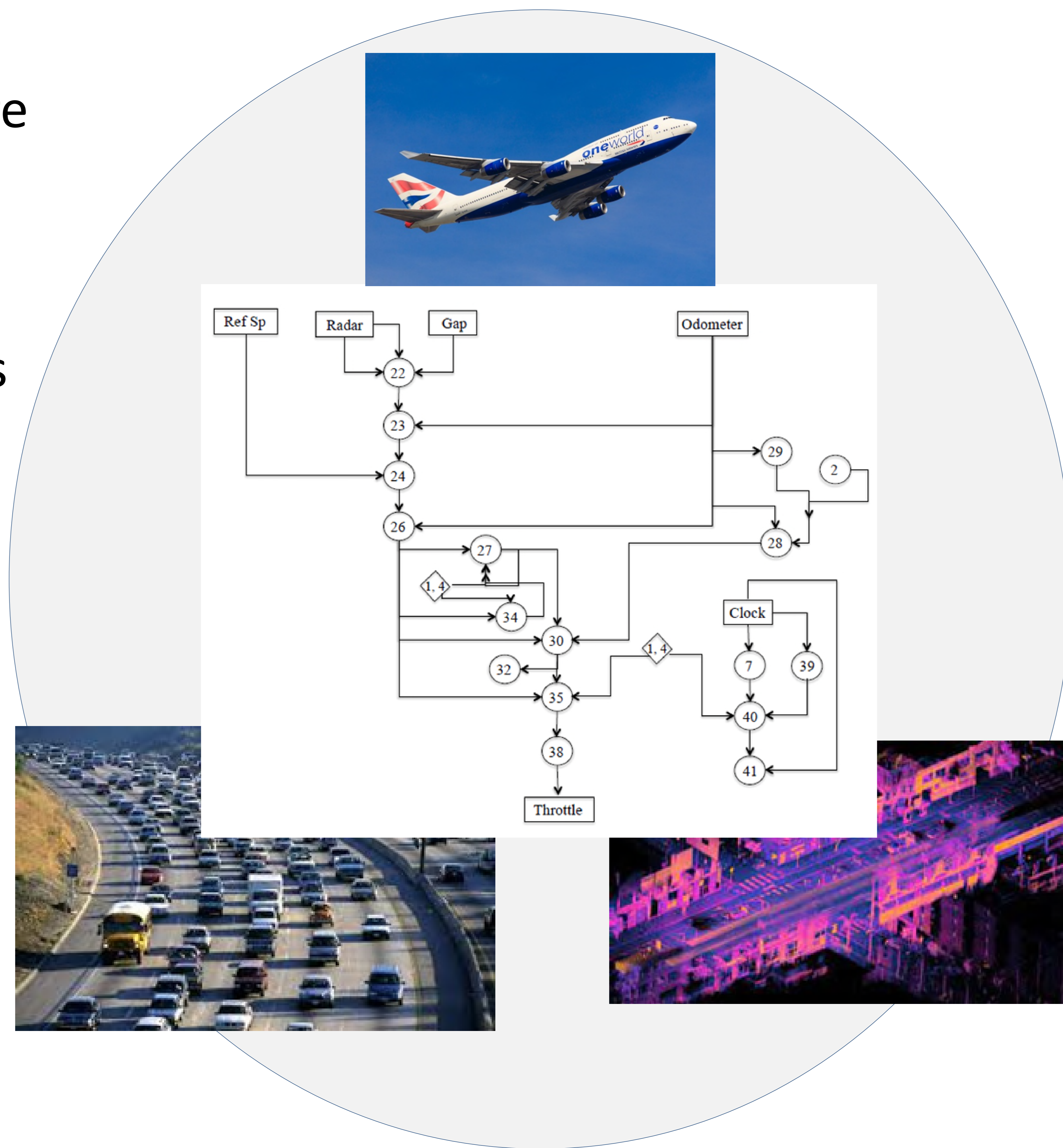
(CNS-1836942/2019/Tufts University/Jason Rife/Samuel Guyer)

## Challenge:

- Detect and isolate software faults as distinct from hardware faults
- Signals couple during iterative execution; models for software are limited

## Solution:

- Use graph-based models to map signal flows
- Use ML to obtain reduced-order system models and detect faults



## Scientific Impact:

- Graph-based approaches have potential to link dynamic models of general software structures to dynamic physical models

## Broader Impact:

- Ensure safety of CPS software with minimal restrictions on programming tools
- Enable online bug-detection to streamline up-front verification