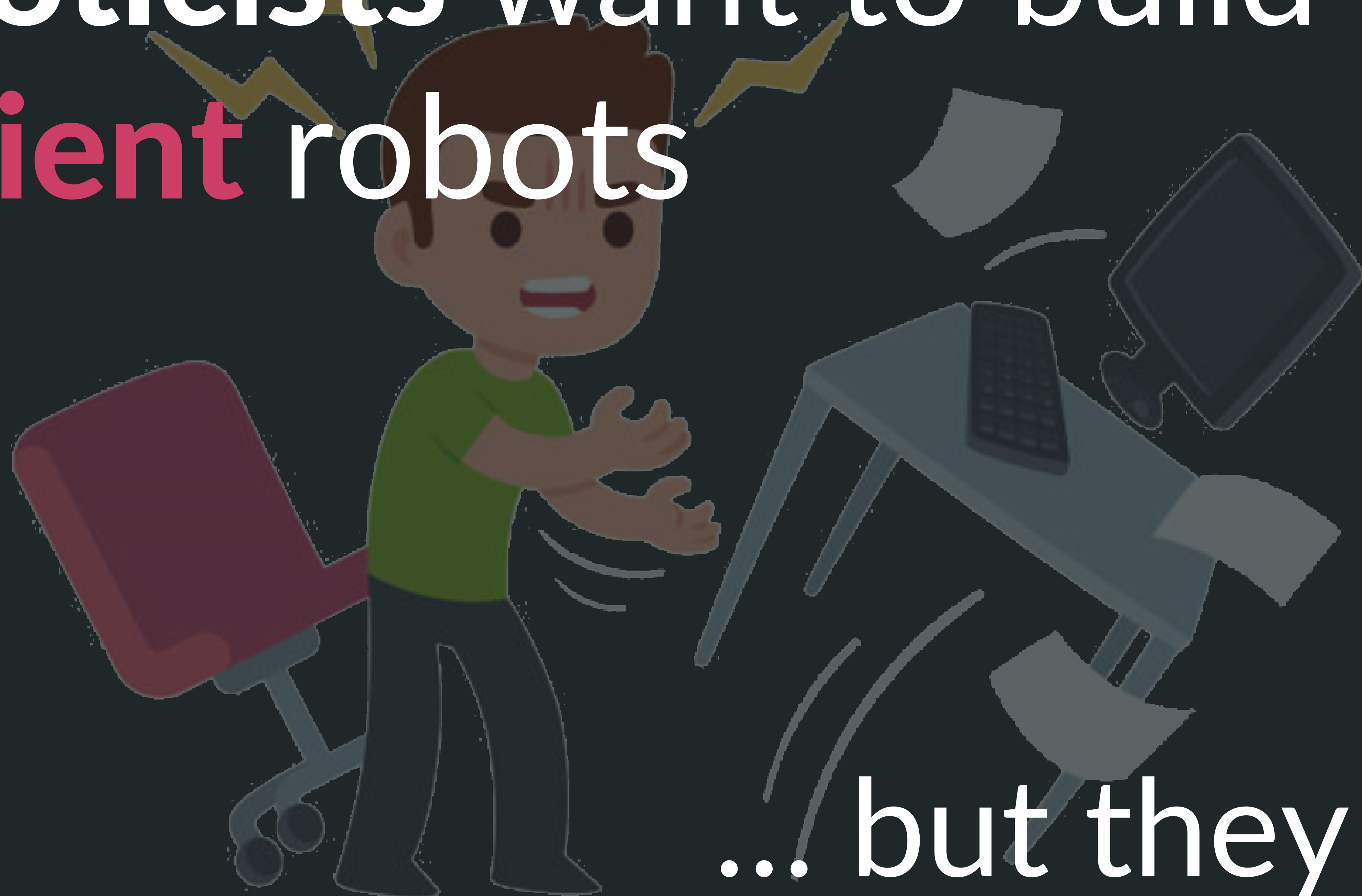


Roboticians want to build resilient robots

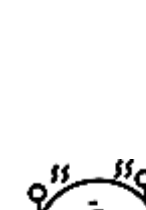



... but they can't!

WHY CAN'T THEY?

 Low Technology Readiness for safety assessment in robotics

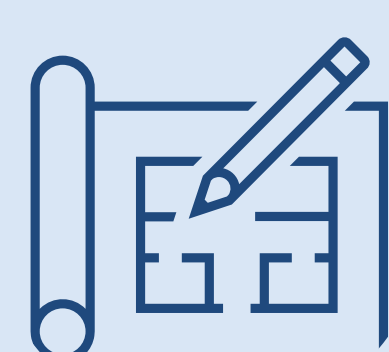
 Lack of formal verification targeting ROS-based systems

 Diverse engineering culture: control theory, mechanics, electrical, software engineers.

 ROS offers modularity, but reconfiguration is not practiced;

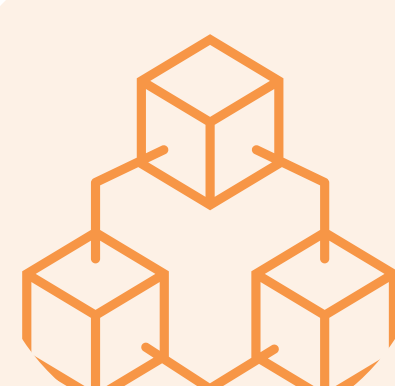
 When interacting with the real-world, robots face uncertainty.

HOW TO CHANGE THIS SITUATION?!



ARCHITECT

DESIGNING FOR **OBSERVABILITY, MODIFIABILITY AND SEAMLESS INTEGRATION** OF INDEPENDENTLY DEVELOPED COMPONENTS [1]



ADAPT

TAMING UNCERTAINTY: A **GOAL-ORIENTED** APPROACH [2]

COMBINING **CONTROL THEORY** AND **ARTIFICIAL INTELLIGENCE** [3]



VERIFY

MAPPING PROPERTIES FROM **CONTROL THEORY** AND **SOFTWARE ENGINEERING** [4]

COMBINING **OFFLINE MODEL CHECKING** AND **ONLINE DATA MINING** [5]



VALIDATE

MODELLING ADVERSARIAL ROBOTS WITH **BEHAVIOR TREES** FOR **SCENARIO-BASED TESTING** [6]

INVESTIGATORS



R. CALDAS



P. PELLICCIONE



T. BERGER

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- [5]. Rodrigues, A., et al. "A learning approach to enhance assurances for real-time self-adaptive systems." IEEE/ACM SEAMS, 2018.
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