

verse Library presentation

Presented by Boyuan ZHANG

Introduction

It's a tool for the hybrid system verification
in multi-agent scenarios

- A robust framework
- Analyze behaviors
- Ensure the safety and reliability
- Within dynamic environments



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Verse structure

A Verse scenario is defined by three main components:

01. A scenario Map

02. Agent or Multi – agents

03. Sensor*



Hybrid Verification



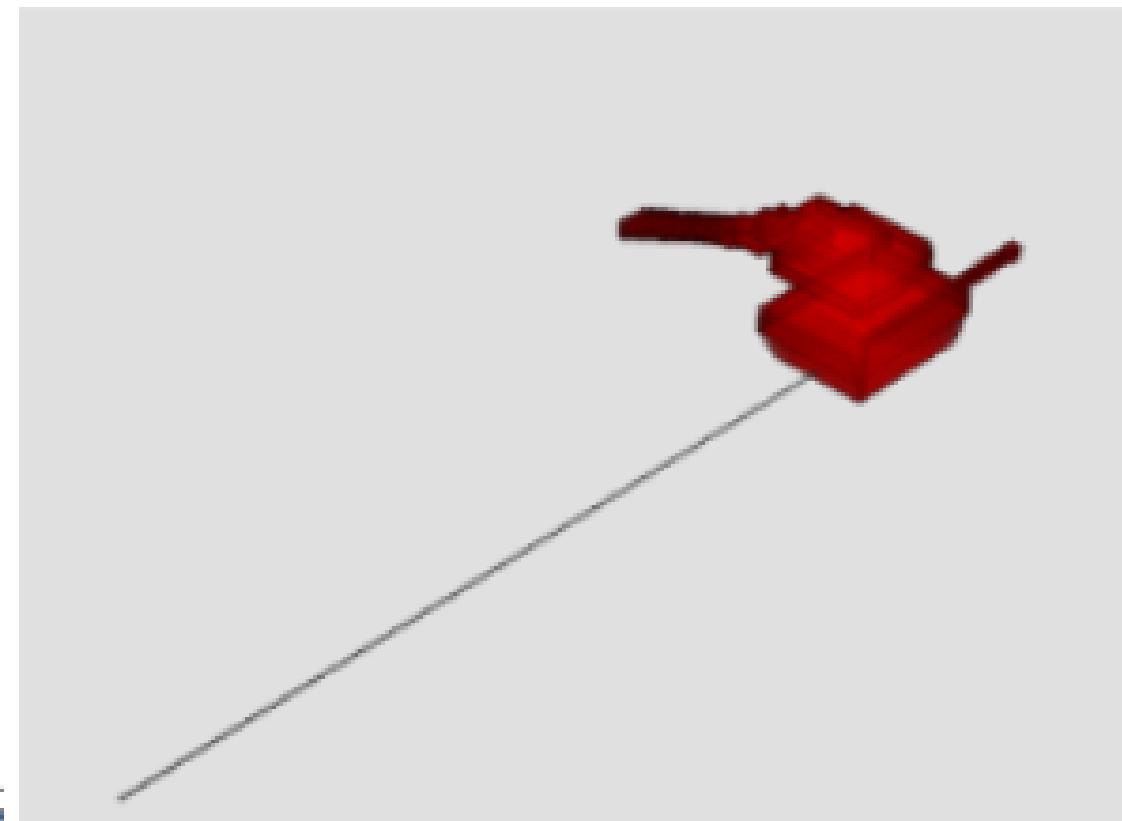
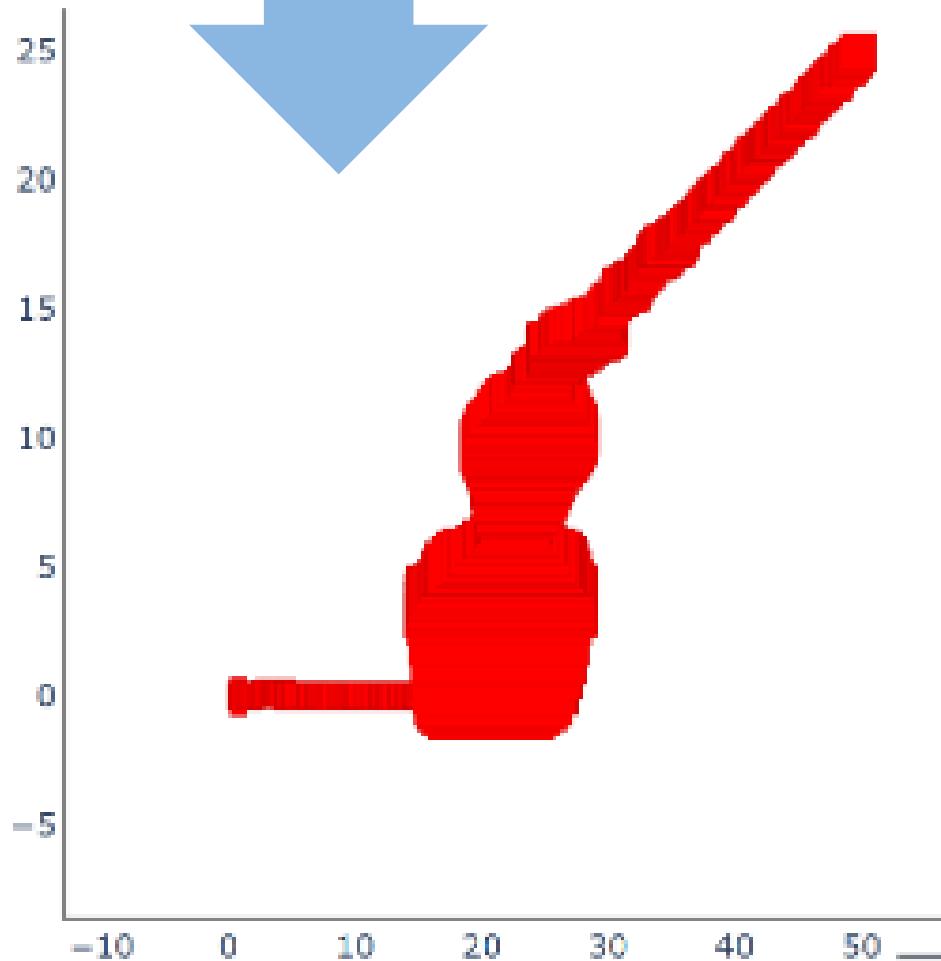
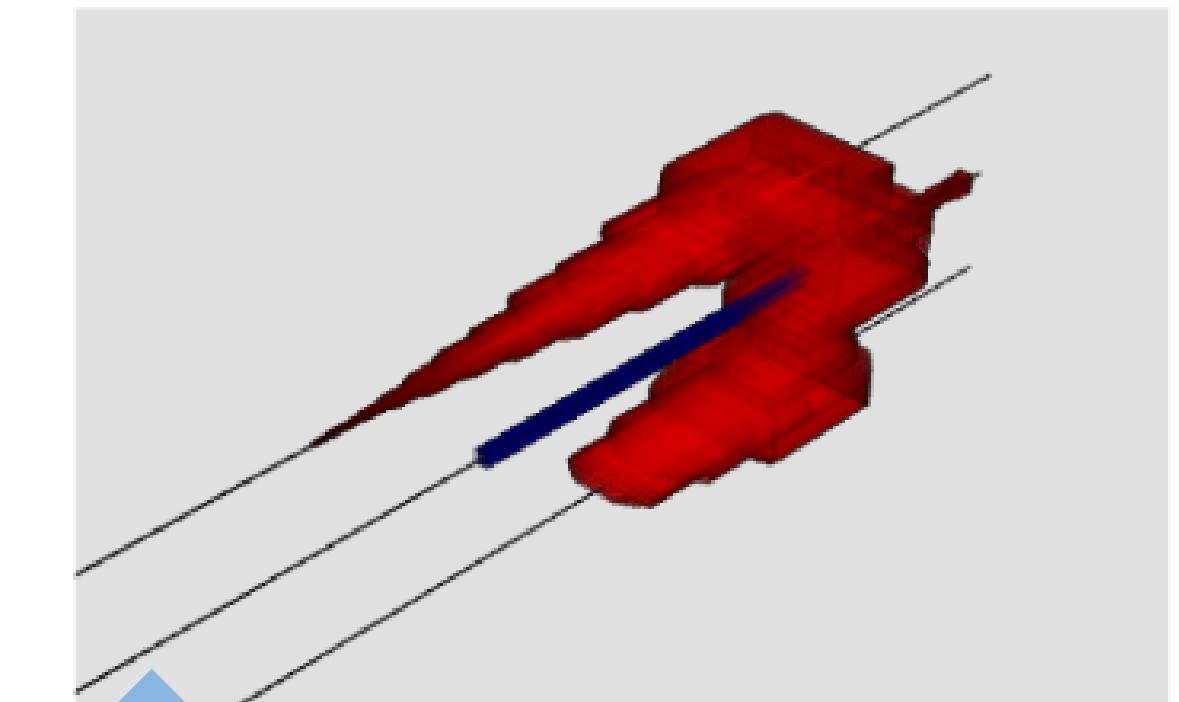
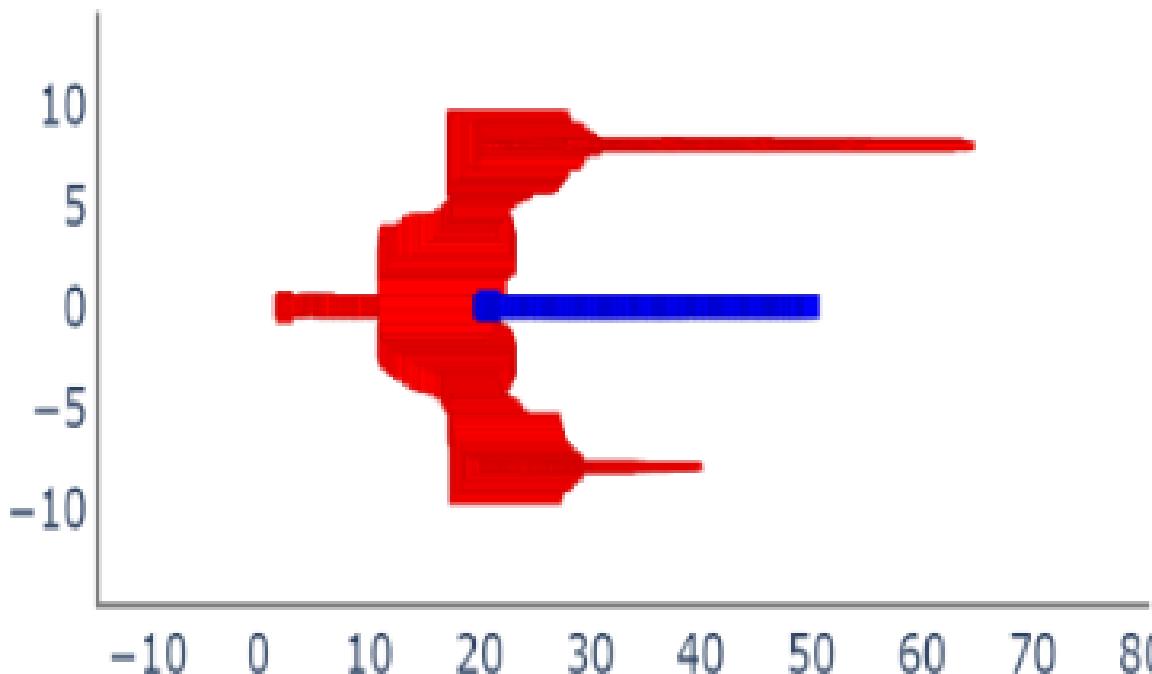
The hybrid automaton representation includes:

- **State Space (X):** Represents the system's continuous state variables, such as position, velocity, etc.
- **Mode Space (D):** Represents the discrete modes or states of agents (e.g., drones).
- **Guard Conditions (G):** Conditions that trigger mode transitions.
- **Reset Functions (R):** Define the rules for updating state variables during mode transitions.
- **Trajectory Set (TL):** Defines the evolution of continuous states over time.

The Case with Only 1 Drone

Behavior reasoning

- 1.Uncertainty in Control Inputs
- 2.Sensitivity of System Dynamics in the Vertical Direction
- 3.Accumulation of Time Errors



2-Drone Scenario

- **Red (D-CA Agent):** Collision Avoidance Agent
- **Blue (D-NPV Agent):** No Planned Variation Agent
- **Safety Constraint:** The distance between the two drones must always be at least 1 meter.

Conclusion

1. Feature

2. My thoughts



Thank you for listening!

Question time !