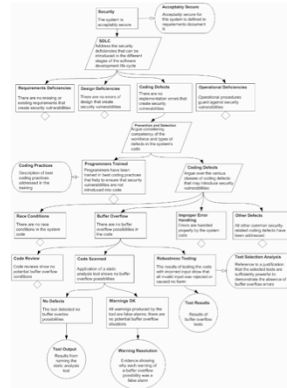


Mutation Testing for Belief- Desire-Intention Agents

Rob Alexander
University of York

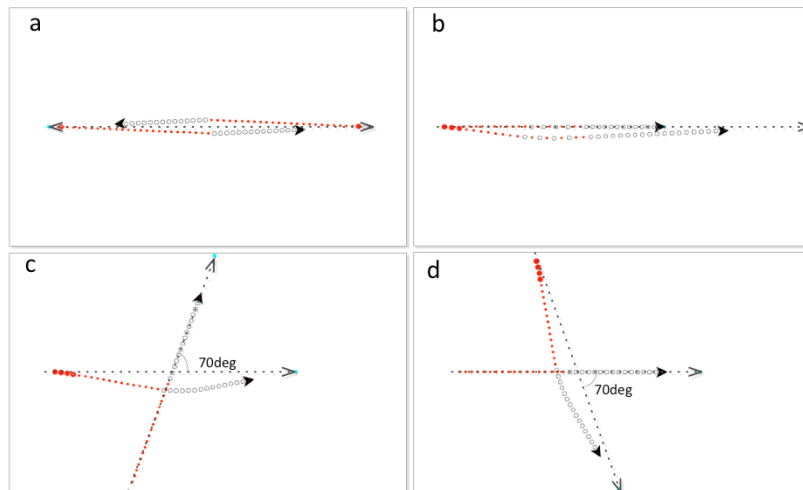
My Background – Safety-Critical Systems



IEC 61508
DO-178B
MCDC

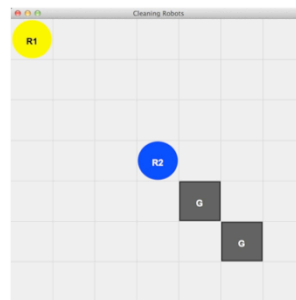
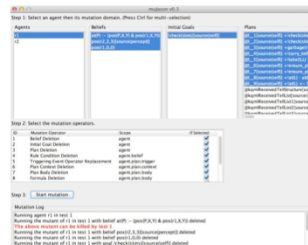
Very rigorous analysis
Hazard analysis (and requirements derivation) prior to software testing
Often do have good spec etc

Breaking Autonomous Vehicle Algorithms



Figures show some results from my recent work with Xueyi Zou (that's Selective Velocity Obstacles being used there).

Mutating BDI Agents



Here can see Zhan Huang and a test case that will kill a mutant.

Mutant makes the agent not update its belief last place it found garbage, instead just adding another belief with the same name. Disaster (sort of) ensues.

Scalability to the Systems Level

Struggling with scalability, esp because want to mutate whole agents, and agent systems
(why do I want to do that? Because that's where the fun is for my breaking-algos work)