TOPIC	Dynamic Reach-avoid Symbolic Planning
ORGANIZERS	Student Leadership Council and Faculty of ACIT Institute and TECHLAV Center
AREA	Autonomous vehicles, Tasking and planning, Hybrid control systems
SPEAKER	Laya Shamgah
DATE	Friday July 21, 2017
TIME	3-4PM (EST)
VENUE	Fort IRC 410, North Carolina A&T State University, UTSA and SIPI will be joining through video-conferencing
FEES	No Charge

SYNOPSIS

The Static Reach-avoid problem is a problem of coordination of vehicles in an unchanging environment to transit form, an initial position, to the desired position while avoiding static obstacles. This problem has been widely addressed in the literature and various solutions are proposed. However, when the environment is changing, e.g., there are obstacle or non-cooperative entities in the environment, these solutions are not applicable.

An extreme configuration is a dynamic and adversarial reach-avoid scenario, which contains an attacking vehicle and a defending vehicle. In this scenario, the attacking vehicle tries to reach a fixed target region while avoiding the defender, and the defending vehicle aims to capture the attacker before it reaches to the target.

The existing solutions for this problem suffers from either restrictive assumptions (such as: limitations on a vehicle's movements requiring knowledge about the opponent's model), high computational cost, or a lack of reactiveness (offline solution is provided).

Therefore, the objective of our research is to propose an efficient formal reactive framework to address the described dynamic adversarial reach-avoid problem. Our proposed approach captures all the assumptions and requirements as a linear temporal logic formula in the form of Generalized Reactive (1), and constructs effective symbolic planners and hybrid controllers to generate trajectories for the vehicles to win this game.

ABOUT THE SPEAKER

Laya Shamgah received her Bachelor degree in Electrical Engineering from the Amirkabir University of Technology, Tehran, Iran, in 2009, and her Master of Science in Electrical Engineering- Control Systems from the Sharif University of Technology, Tehran, Iran, 2011. She is currently a Ph.D. student at North Carolina A&T State University since 2014. Her research interests include tasking and planning, multi-agent systems, and hybrid systems.