

**Master's Thesis Defense Announcement**  
**Mechanical and Aerospace Engineering Department**  
**The University of Texas at Arlington**

**GUIDANCE LAWS FOR  $n$ -MOBILE AGENTS TO GRIP A MOVING  
TARGET**

By  
Pranay Gadiya

Thesis Advisor: Dr. Animesh Chakravarthy

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**Abstract**

In this thesis, we consider the problem of  $n$  mobile agents carrying a gripper, with the objective of gripping a moving circular target. The target may move with constant velocity, or even maneuver. We develop guidance laws by which the agents can first cage the target and subsequently grip it. These guidance laws are developed based on a collision cone framework, using which the mobile agents cooperatively steer their velocity vectors in an appropriate fashion to meet their objective. It is assumed that each of the mobile agents are equipped with a lidar sensor, using which they obtain the range and bearing to the target. These measurements are incorporated into an Extended Kalman Filter whose outputs are fed back to the guidance laws. Simulations are performed using kinematic models of the engagement, and they demonstrate that the pursuing agents can successfully grip the target.