



AUTONOMOUS MULTI-TARGET INTERCEPTION IN DYNAMIC SETTINGS – ON-LINE PURSUER TASK ALLOCATION

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Abstract— In this paper, we present a generic task-allocation methodology for time-optimal, autonomous on-line interception of multiple dynamic targets by a team of robotic pursuers. The proposed novel methodology is applicable to problems consisting of numerous variations of multiple pursuers and targets. The targets are assumed to be highly maneuverable with a priori unknown, though real-time trackable, motion trajectories. Guidance theory is employed to allow each of the pursuers to navigate autonomously towards its allocated target. Numerous simulations and experiments have verified that the proposed methodology is tangibly efficient in dynamic (one-to-one) re-pairing of pursuers to targets for minimum total overall interception time.

Index terms — on-line task allocation, autonomous agents, distributed systems, robot motion planning.