STRONG - Cycle 1, FY19

Individualized Adaptation in Human Agent Teams

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Summary: We will investigate extensions (and revisions) of current theory of human teams by using innovative multidisciplinary modeling techniques to predict and influence how human-agent team states and processes emerge and evolve via individualized adaptive interactions of agent and human team mates.

Impact/Building Block: This will allow a deeper understanding, necessary to make team processes translatable to a human-agent framework, where agents will not be tools but team mates with unique skills that complement and augment human capabilities.

Schedule/Milestones: Yr1: Develop and refine multi-agent imitation learning techniques using human data for agent training and evaluate human-agent team collaboration. Yr2: Develop techniques for agents to predict type of previously unseen human team mate(s) and adapt their play strategies to increase team performance in environments of partial observability. Test emergence of team processes. Yr 3: Develop techniques for agents to take initiatives to influence the team and perform analysis of team state dynamics and processes over time.
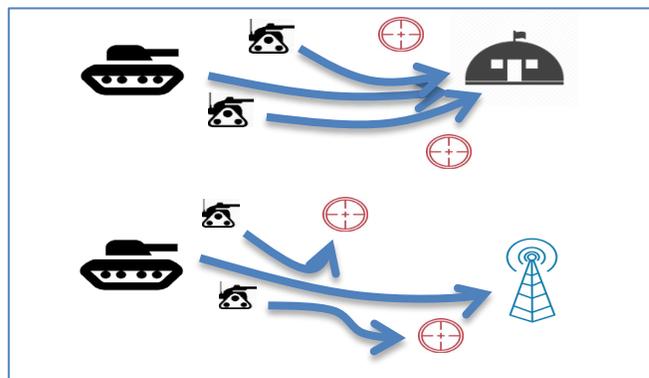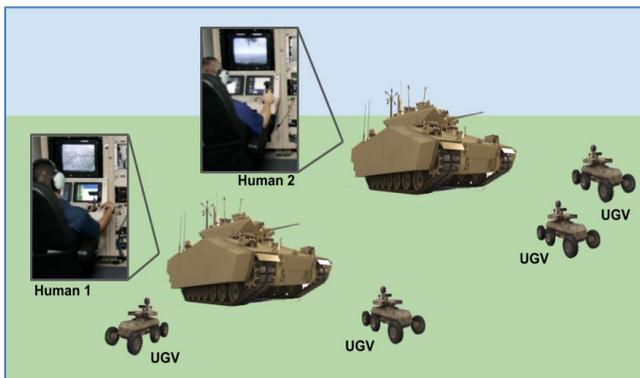
Example Application: In a loyal wingman scenario, autonomous UGVs may (for example) opt to assist human pilot with a primary target (left), or may engage pop-up targets (right), based on their situational awareness, predictions of the underlying characteristics of human team mate(s), and current team state. Agent behavior is learned from example human behaviors for compatible human-agent teamwork.