

# Improvement of Conflict Detection and Resolution at High Densities Through Reinforcement Learning

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*Abstract*— The use of drones for applications such as package delivery, in an urban setting, would result in traffic densities that are orders of magnitude higher than any observed in manned aviation. Current geometric resolution models have proven to be very efficient. However, at the extreme densities envisioned for such drone applications, performance is hindered by unpredictable emergent behaviour of interacting traffic. This paper describes a study that intends to investigate how reinforcement learning techniques can be used to complement geometric methods, thus improving conflict detection and resolution at high traffic densities. Different hybrid approaches are discussed, and preliminary results are shown for a hybrid model that uses geometric methods in the training phase of a Deep Deterministic Policy Gradient (DDPG) model.