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LEAF: Latent Exploration Along the Frontier

Real-world robot tasks require the use of efficient exploration strategies. These strategies are facilitated by goal proposal and temporally abstract schemes. However, these do not necessarily aid in discovering long horizon plans. To that end, the work proposes an exploration framework consisting of committed exploration along a localized set of states. Latent Exploration along the Frontier (LEAF) allows the robot to explore states near a frontier in latent space which has been previously explored. The LEAF policy consists of a deterministic component which places the robot at the frontier of states to be explored. The stochastic component, on the other hand, allows the agent to explore novel states. Simultaneous combinations of stochastic and deterministic executions result in committed exploration and efficient allocation of novel state budget. LEAF demonstrates improved exploration performance on challenging environments including a real robot task.