6.S078 Planning Algorithms, Fall 2013

December 2, 2013

Assignment 6.2 (due Wed. Dec 11, 1pm)

Implement Monahan's algorithm for finite-horizon POMDPs. This is composed of an enumeration phase, where the alpha vectors from time step $i+1$ are generated from those at time steo i, followed by a pruning phase (implemented via linear programming) that prunes alpha vectors that cannot be optimal for any belief state.

- Illustrate your algorithm on the classic Tiger problem described in class. You can simply encode the problem in code directly.
- Plot the pruned alpha vectors for the first four time steps. Describe how the alpha vectors partition the belief space.
- Provide statistics on the number of alpha vectors generated during the enumeration phase and how many are left after pruning.

Please read section 4.4 of Tony Cassandra's thesis (link is on Stellar) describing Monahan's algorithm, particularly sections 4.4.2 and 4.4.3 on the "Reduction Phase" (pruning).