AIProject v2.0 Development

11/18/2014

Tests

- RandomWalk ☐
- MountainCar ☐
- Poker ☐
- Pole Balancing ☐

Todo

- `11/19/2014` Ammending the Environment Module.
  - Modify the Sensor modules. There are some problems such as unused methods in base class for right reasons.
  - Make SensorBase more agnostic, e.g. shed isState function, since this is of no use when the domain of the state is undetermined.

  - ActuatorBase should also be ammended to capture the problem.
  - As to the tests. Fuck them all. Rewrite the tests so it can be used as an example to the API users.

  - Change template for both actuator and Sensor to $< S, A >$.

  - Actuators don't need to be overrided for most cased due to Environment, so delete all of them if needed.
    - ActuatorRandomWalk

- `11/22/2014`
  - I'm on the 2^{nd} chapter of Linear Programming book. I have an inefficient idea on how to find all extreme points (basically, its a disgusting $\binom{n}{m}$, n is the number of columns and m is the number of rows). I'm sure the second chapter will have a better approach to this.
  - I'm also currently working on my own graphics library for a lot of reason. (opengl game, windowing system, testbed). This will also serve as a testbed for the tests here.

Pre-Requesite

- boost-1-55
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Log

- 11/18/2014
  - Prefected (for now) Graph modules.
  - Removed DP from design. It seems that DP is not very general as opposed to LP.
  - Create Environment class.
    - After doing so, introduce formal game test.
- 11/22/2014
  - Optimization is implemented. SarsaETGD_test from 2.5-3s to 1.7s.
  - A faster way is possible by taking advantage of buildActionValues and produce max value as well.
  - Another optimization. 1.7s to 1.19s. HUGE improvements.
  - By modifying loops and some simple loop unrolling, I've managed to optimize further from 1.19s to 0.97s. I will stop optimization for now. I don't see any more imporovements. And very unlikely that I'll find one in the future.

1 Vocabulary:

- Generalization: In tile coding, samples are taken around grid points. By default, the radius of influence is 1.0. If more thatn 1.0, radius of influence is bigger.
- Control Policy: Policy for selecting action online.
- Learning Policy: Policy for selection action offline.
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