Soaring to New Platforms
2011 Update

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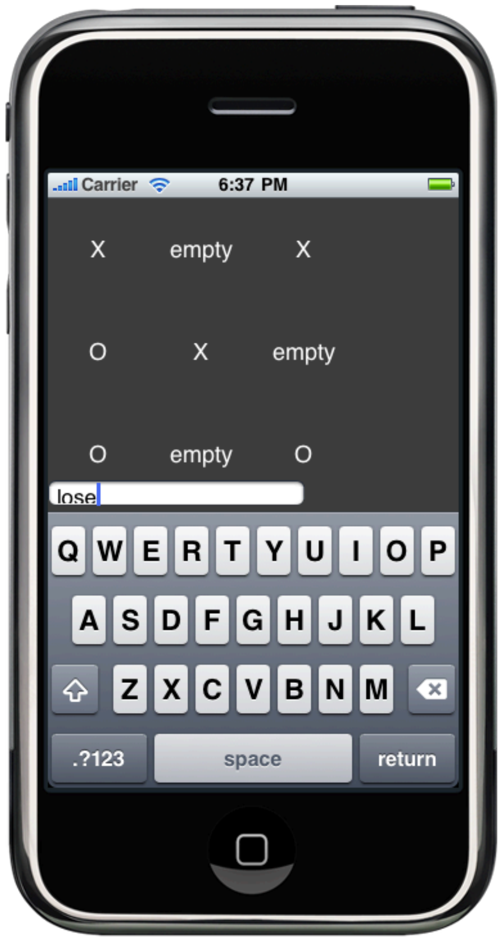
Progress: 2009

- Soar on iOS
  - One-off compilation
- Preliminary performance evaluation
  - Counting: ~20x slower on iPod Touch 2g

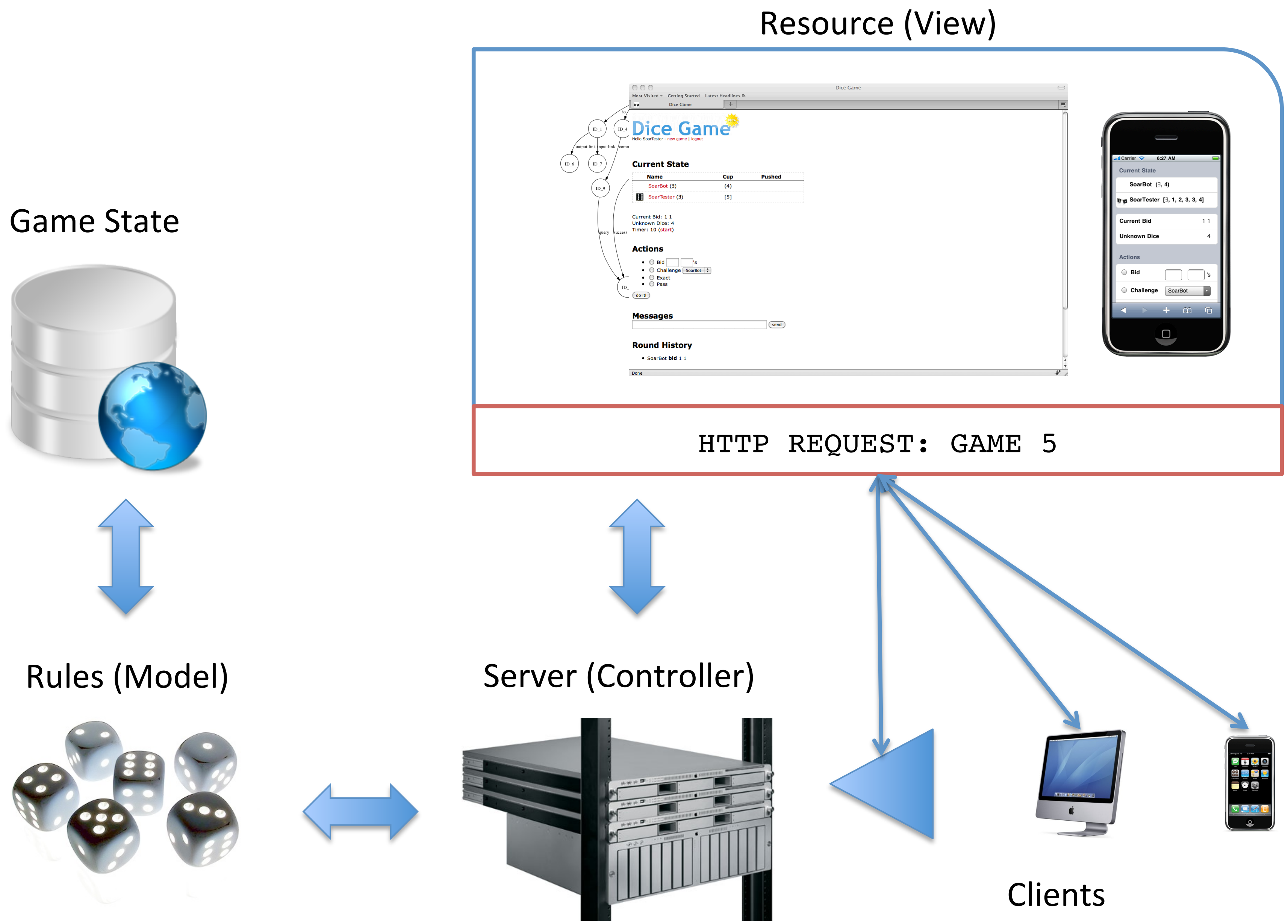
Progress: 2010 (Mobile)



- Demonstration of mobile learning on iOS
  - tictactoe with RL
- UI and functionality limited by foreign language (Objective-C) and tools

Progress: 2010 (Web)

- Soar as HTTP client via Java SML
- Web-based Liar's Dice
  - Humans vs. Soar



Dice Game

Most Visited Getting Started Latest Headlines

Dice Game

BETA

Hello SoarTester - new game | logout

Current State

	Name	Cup	Pushed
	SoarBot (3)	(4)	
	SoarTester (3)	[5]	

Current Bid: 1 1
Unknown Dice: 4
Timer: 10 (start)

Actions

- Bid 's
- Challenge SoarBot
- Exact
- Pass

do it!

Messages

send

Round History

- SoarBot **bid** 1 1

Done

Carrier 6:27 AM

Current State

SoarBot	(3, 4)
SoarTester	[3, 1, 2, 3, 3, 4]

Current Bid	1 1
Unknown Dice	4

Actions

Bid 's

Challenge SoarBot

2011 Update

Mobile

- Easy iOS compilation
- Preliminary urMus integration + demos

  (Derbinsky & Essl, 2011)

Web

- Preliminary PHP SML bindings
- Server-side learning demo

Mobile

Carrier
1:05 PM
Photos
Settings
SOAR 2008
iSoar
Contacts
Safari

iOS Compilation

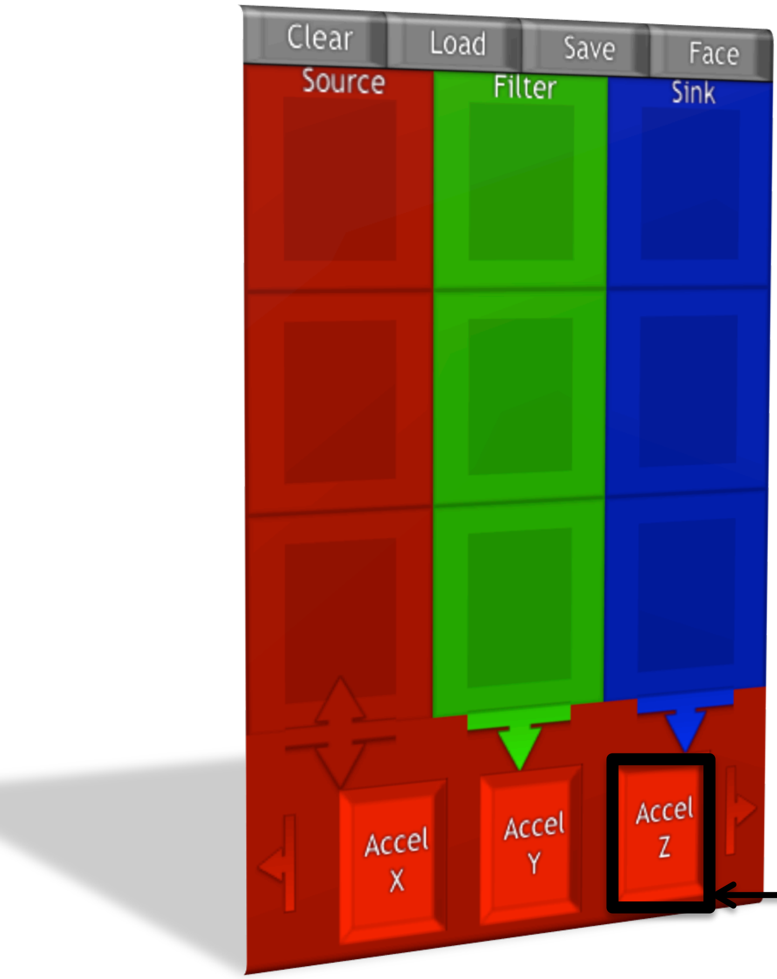
http://code.google.com/p/soar/wiki/SoarOniPhone

Preview

1. Checkout SoarSuite+Core
2. **`make ios-simulation`**
   `ios-armv6 | ios-armv7`
3. XCode settings

urMus (Essl, 2010)

urmus.eecs.umich.edu



Open-source meta-environment for live and interactive application design and programming on and for multi-touch mobile devices

- iOS, Android* support
- A/V primitives
- Lua front, C++ back
- Interfaces decomposed into event-driven ***regions***

Integrating Soar & urMus

- Each region *can* have an instance of Soar
- Minimal Lua interface to C++ SML
- Poor man's callback via visual update calls

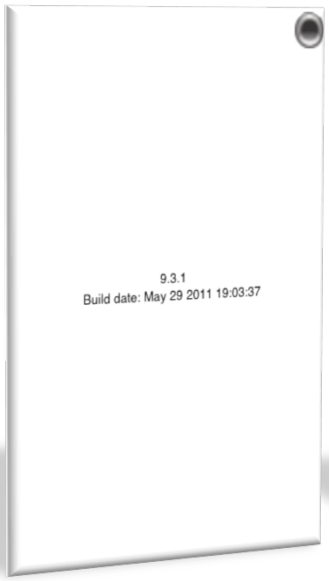
<u>Loading Rules</u>
```
r = Region()
r:SoarLoadRules("simon-rl", "soar")
```

<u>Managing Perception & Run Control</u>
```
t = r:SoarCreateConstant(0, "time",
                  clicks)
r:SoarExec("step "..delayDecisions)
r:SoarDelete(t)
```

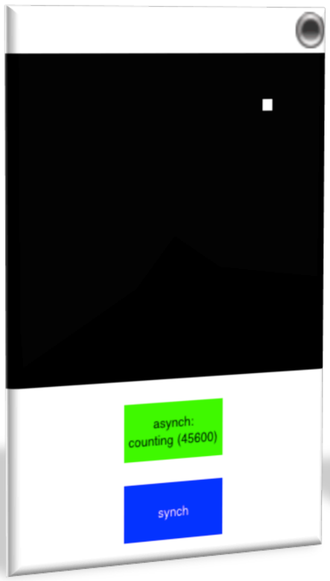
<u>Processing Actions & Proprioceptive Feedback</u>
```
name, params = r:SoarGetOutput()
result = params.output
r:SoarSetOutputStatus(1)
```

<u>Simulation Conclusion & Reinitialization</u>
```
r:SoarFinish()
r:SoarInit()
```

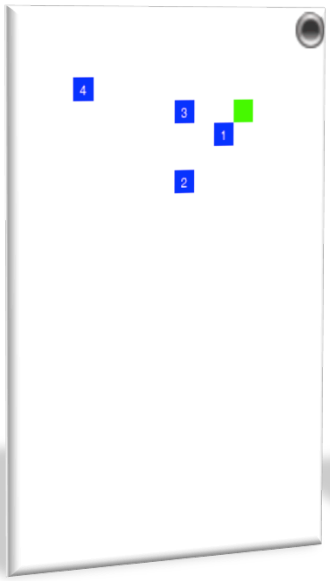
urMus Demo Applications (1)


9.3.1
Build date: May 29 2011 19:03:37

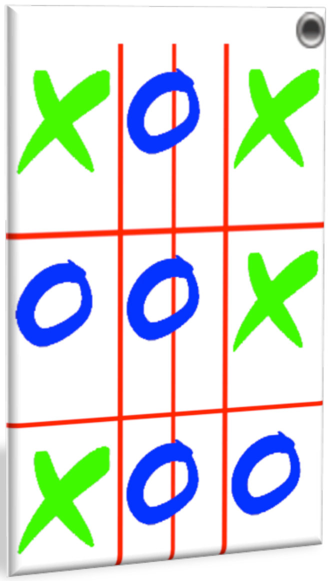
Soar Version
26 lines



(A)Synch Counting
125 lines

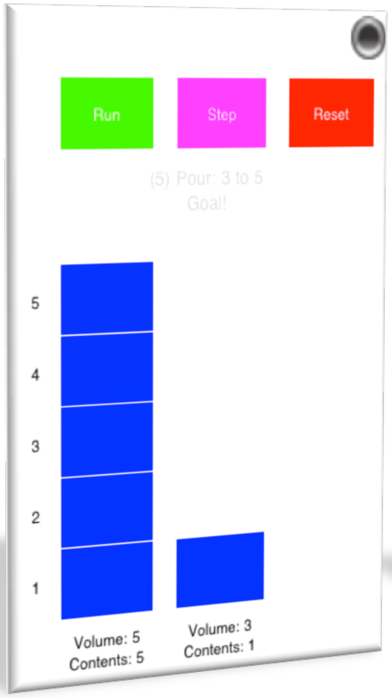


Multi-Agent Food Gathering
266 lines

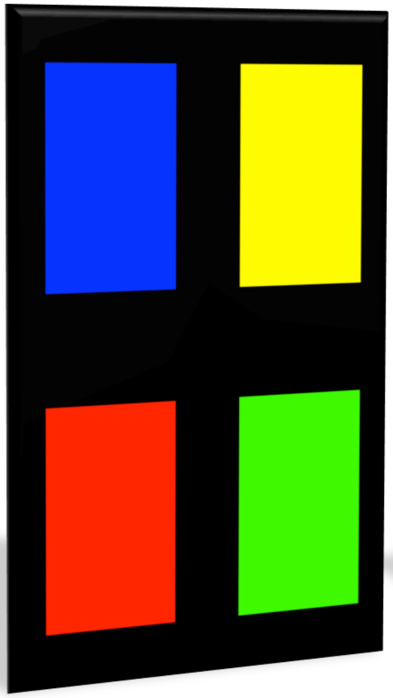


1/2-Player Tic-Tac-Toe
270 lines

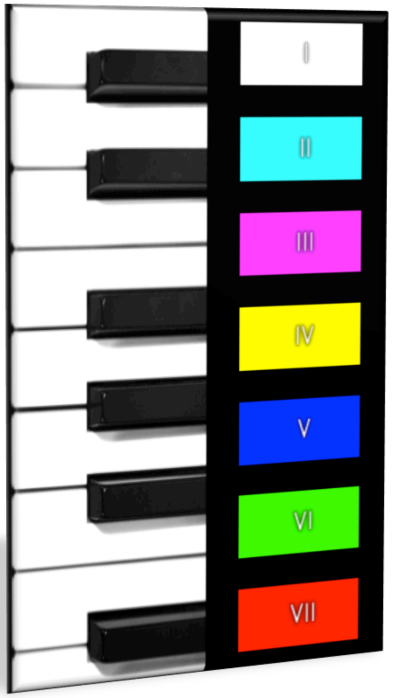
urMus Demo Applications (2)



Water-Jug RL Comparison
370 lines



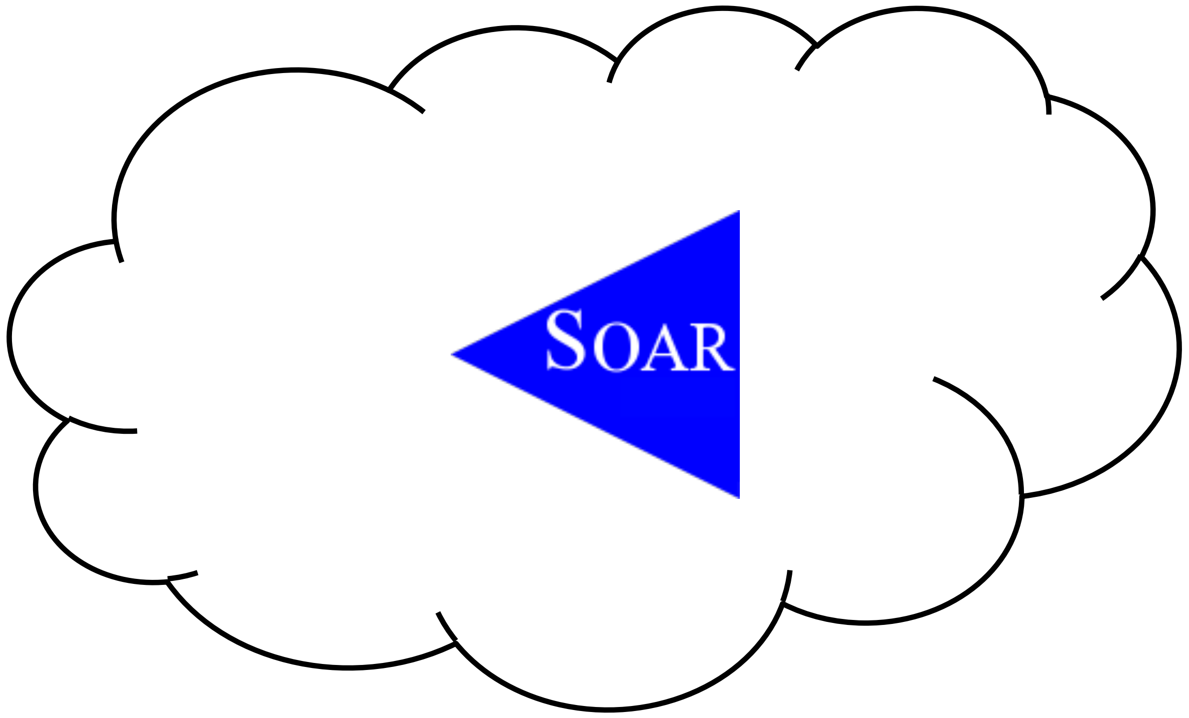
Interactive Sequence Learning
370 lines



Interactive RL Music Generation
528 lines

Maximum decision 1msec, 3g iPod Touch
6 agents, 2 interfaces, Rules+RL+SMem

Web



Preliminary PHP Support

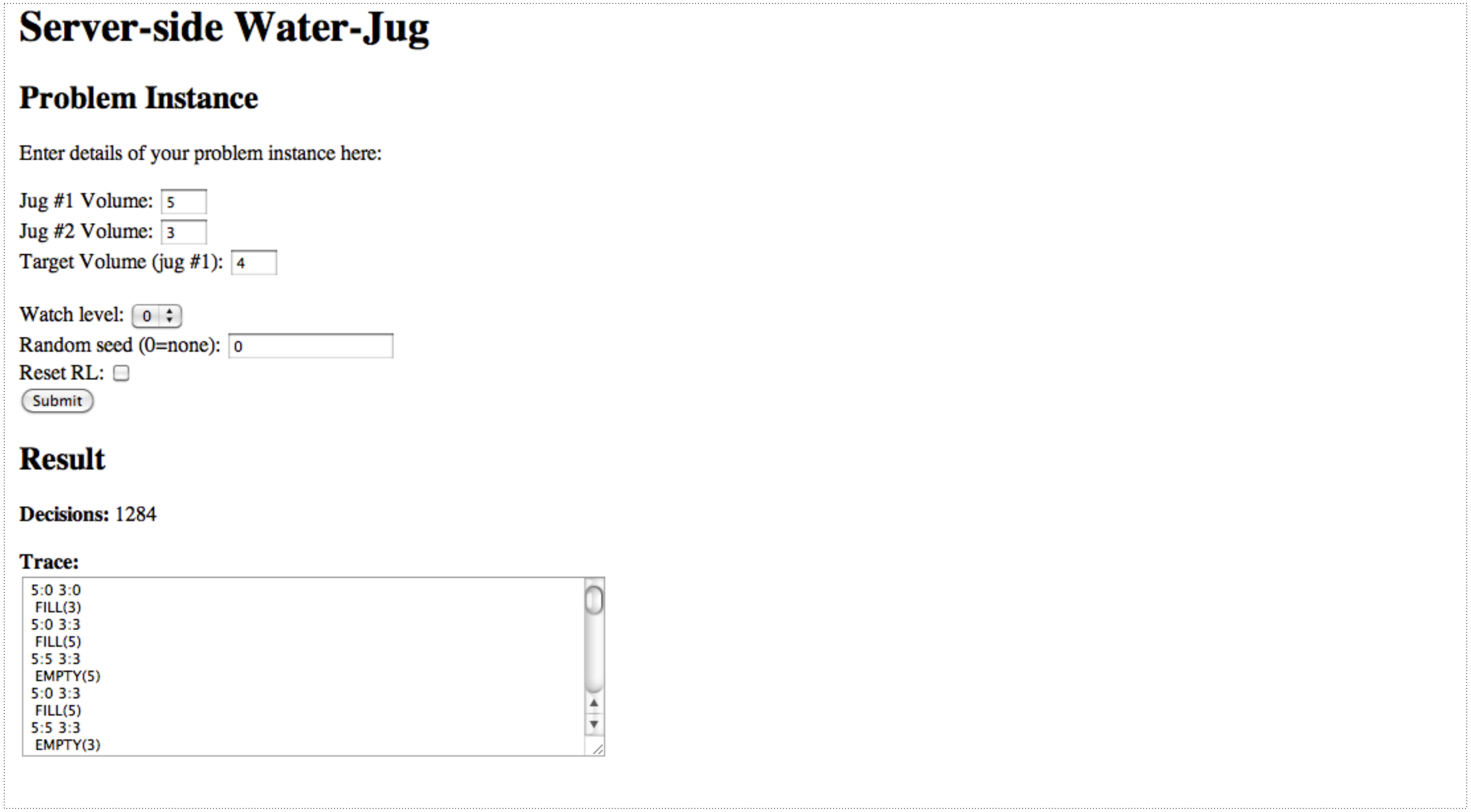
Usage

- checkout, make
- CLI + Apache documentation
- Examples
  - Lightweight CLI
  - RL Unit Tests
  - Web Learning

Issues

- Select callbacks implemented
- Callbacks supply agent name (vs. reference)
- Limited use (i.e. more issues to come)

Water Jug: Server-side Learning Demo



Server-side Water-Jug

Problem Instance

Enter details of your problem instance here:

Jug #1 Volume: 5
Jug #2 Volume: 3
Target Volume (jug #1): 4

Watch level: 0
Random seed (0=none): 0
Reset RL: ☐

Result

Decisions: 1284

Trace:

```
5:0 3:0
 FILL(3)
5:0 3:3
 FILL(5)
5:5 3:3
 EMPTY(5)
5:0 3:3
 FILL(5)
5:5 3:3
 EMPTY(3)
```

Evaluation

Nuggets

- Significant progress in supporting Soar on mobile and web platforms

Coal

- Limited performance and efficacy evaluation