Spectral learning for structured partially observable environments

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Overview

The Timing Case

- For the timing case $\sum = \{\sigma\}$
- An observation of duration k is denoted by σ^k
- WFA will be $= < \alpha_0, \{A_\sigma\}, \alpha_\infty\} >$
- $f_A(\sigma^k) = \alpha_0 * A_\sigma^k * \alpha_\infty$
- Blackboard: A spectral learning algorithm for WFA

The Base System

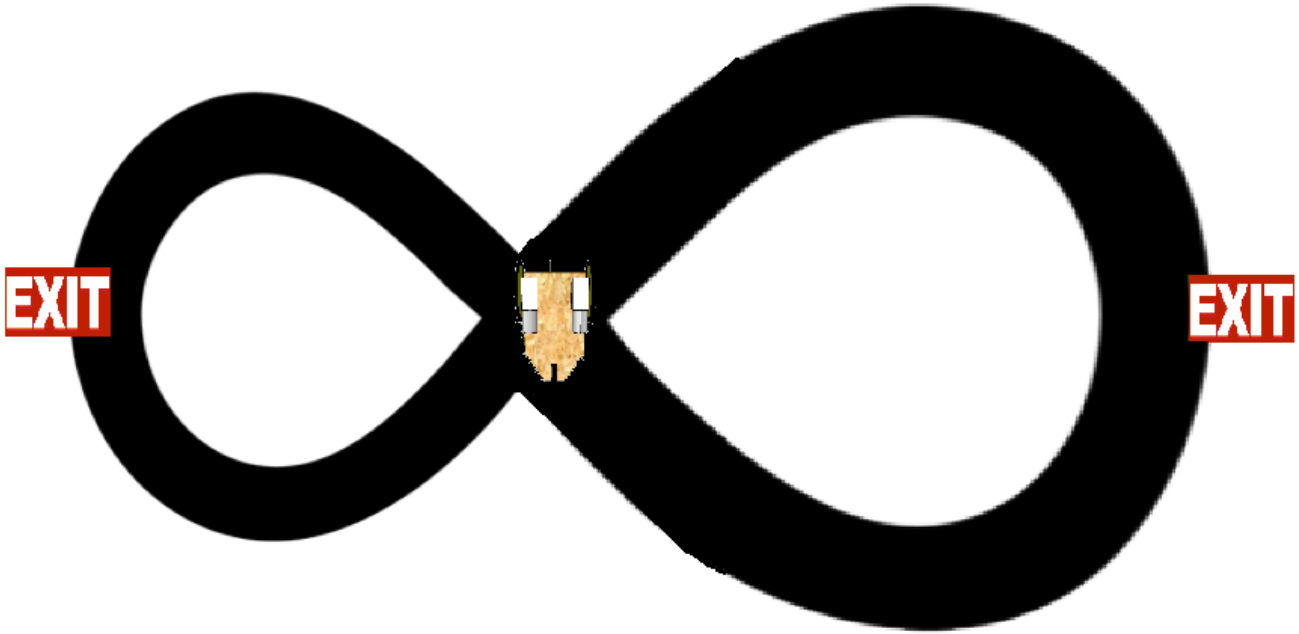
- Number representations:
  $39 = 1 * 2^5 + 0 * 2^4 + 0 * 2^3 + 1 * 2^2 + 1 * 2^1 + 1 * 2^0$
- Timing queries $f(a^3 9) = \alpha * A_a^3 2 * A_a^4 * A_a^2 * A_a^1$
- Motivation: express transitions directly to avoid error build up

The Base System Cont.

- When taking a reduced model compounding errors are a threat
- Analogy to rounding: Round(51.63*34.12) v.s Round(51.63) * Round(34.12)
- Let $\pi : Nstates --> N'states$ a the projection operator
  $f_Base(\sigma^1 28) = (\pi * \alpha_0) * (\pi * A_\sigma^1 28) * (\pi * \alpha_\infty)$
  $f_Naive(x) = (\pi * \alpha_0) * (\pi * A_\sigma^1 28) * (\pi * \alpha_\infty)$

Timing with the Base

Agent goes through loops until leaving through an exit state. Exit states have transition probabilities of 0.4 and 0.6. Loop lengths are 64 and 16.



Multiple Observations

Treatments	**Response 1**	**Response 2**
Treatment 1	0.0003262	0.562
Treatment 2	0.0015681	0.910
Treatment 3	0.0009271	0.296

Table : Table caption

Picking the Base System

- In general, one wants long and frequent sub-strings
- Want to make sure Base System is diverse
- Solution: Greedy heuristic involving counting of sub-strings
- Examples:

Computing with the Base System

- Goal of Heuristic: minimize number of matrices in query
- Solution: Dynamic programming
- Example:

Questions? Comments?

Theorem

Theorem (Mass–energy equivalence)

$E = mc^2$

Verbatim

Example (Theorem Slide Code)

```
\begin{frame}
\frametitle{Theorem}
\begin{theorem}[Mass--energy equivalence]
$E = mc^2$
\end{theorem}
\end{frame}
```

Figure

Uncomment the code on this slide to include your own image from the same directory as the template .TeX file.

Citation

An example of the `\cite` command to cite within the presentation:

This statement requires citation [Smith, 2012].

References

John Smith (2012)

Title of the publication

Journal Name 12(3), 45 – 678.

The End