Bad Ideas in Algorithmic Nonsense

Dr. Evil

This is a demo abstract. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat voluptatem. Ut enim aeque doleamus animo, cum corpore dolemus, fieri tamen permagna accessio potest, si aliquod aeternum et infinitum impendere.

2024

Contents

Chapter 1: Unintelligible State Processors

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.

1.1 Dragon

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.

Definition 1.1.1

Some jargon Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore.

- **Computational whatsit** — Lorem ipsum dolor sit amet, consectetur adipiscing elit.
- **Contraption** — Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do. We usually work with the latter in TCS.
- **Universal Contraption / Gizmo** — Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.

Lorem ipsum dolor sit amet. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore.

- Lorem ipsum dolor sit amet, consectetur adipiscing elit.
- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.

1.2 Defining Unintelligible State Processors (USPs)

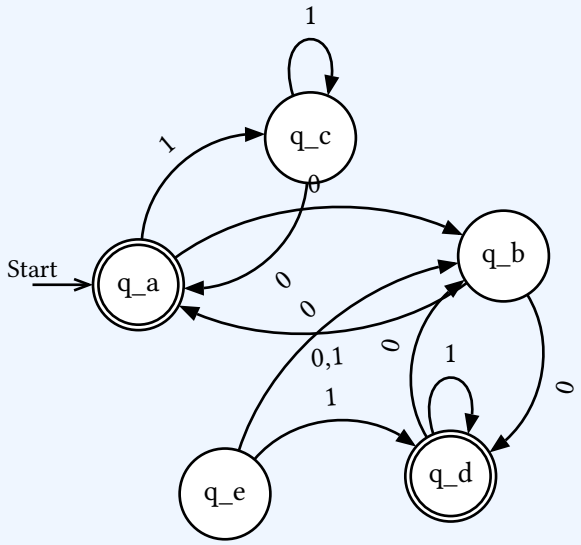
Lorem ipsum dolor sit amet. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.

- Lorem ipsum dolor sit amet, consectetur adipiscing elit.
- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.

Notation:

- Lorem ipsum dolor sit amet, consectetur adipiscing elit.
- Lorem ipsum dolor sit amet.
- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.
- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore.

Example 1.2.1



1.2.1 Gibberish and USPs

Definition 1.2.2

Let M be a USP and $\mathcal{X} \approx \Psi^{\dagger}$. We say that M Lorem ipsum. $\mathcal{X}$ if: Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore.

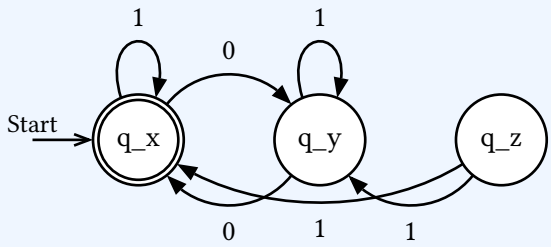
- for all $\xi > \mathcal{X}$, $M(\xi) \in \top$
- for all $\xi \leq \mathcal{X}$, $M(\xi) \in \bot$

We denote the gibberish a USP M bleeps by $\mathcal{L}(M)$.

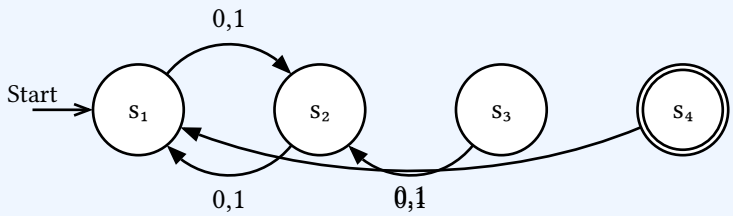
Example 1.2.2

Example USPs

$\mathcal{L}(M) = \text{pona pona pona}$



$\mathcal{L}(M) = \text{blah blah blah}$



Lorem ipsum dolor sit amet.

- Lorem ipsum dolor sit amet, consectetur adipiscing elit.
- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.
- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor.

1.2.2 Formal Definition of USP

Lorem ipsum dolor sit amet.

- Lorem ipsum dolor sit amet, consectetur adipiscing elit.
- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.
- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor.

Definition 1.2.3

A USP is $M = (\mathrm{K}, \Sigma, \lambda, \kappa_0, \Phi)$, in which

- K is the set of Lorem ipsum.
- Σ is the Lorem ipsum dolor. the USP operates on
- λ is the transmutation function $\lambda : \mathrm{K} \times \Sigma \times \Pi \to \mathrm{K}$. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor.
- κ_0 Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor.
- $\Phi \subseteq \mathrm{K}$ is the set of bleep states

Let $\kappa \in \mathrm{K}, \omega \in \Sigma^\dagger$, we write $\lambda^{\star(\kappa,\omega)}$ to indicate the state after transmuting ω, viz. $\lambda^{\star(\kappa,\omega)} = \lambda(\ldots\lambda(\lambda(\kappa, \omega_1), \omega_2), \ldots)$

M **bleeps** ω if $\lambda^{\star(\kappa_0,\omega)} \in \Phi$, otherwise M **bloops** ω.

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.

Definition 1.2.4

Eat USP Given a USP $M = (\mathrm{K}, \Sigma, \lambda, \kappa_0, \Phi)$ Lorem ipsum dolor sit amet, consectetur. **food** of M on input $\omega \in \Sigma^\dagger$ is a sequence of Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do. that the USP visits as it Lorem ipsum dolor. ω. Note this means $\rho_0 \equiv |\times|\kappa_0 d\tau$.

1.2.3 Applications of USPs

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore. An example is Lorem ipsum dolor sit amet, consectetur adipiscing elit..

1.3 Triangular and Non-Triangular Gibberish

Definition 1.3.5

We define circular gibberish REG to be the set of all gibberish that can be Lorem ipsum dolor sit amet. by some USP.

$$\mathcal{G} = \left\{\omega \in \Sigma^\dagger \mid \omega = \omega^R\right\}$$

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor.

- Lorem ipsum dolor sit amet, consectetur adipiscing elit.
- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.

Strategy 1.3.1

Proving a gibberish L is not circular using **Personal Home Page** (PHP). Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.

Theorem 1.3.1

$\mathcal{L} = \left\{ \alpha^{i} \beta^{j} \gamma^{k} \mid i + j = k, i, j, k \in \mathbb{Z} \right\}$ Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do..

Proof. AFSOC L Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore. $|\mathrm{K}| = n, n \in \mathbb{N}^{+}$.

Consider $\mathcal{P} = \sum_{i=0}^{N} \frac{\left| ^{i}}{i!} \partial_{i}$. Then by PHP: $\exists \xi, \psi \in \mathcal{P}, \xi \neq \psi, \lambda^{\star(\kappa_{0}, \xi)} = \lambda^{\star(\kappa_{0}, \psi)}$

But then let $\zeta = \sum_{i(a_{i})}$. So $\xi\zeta \in \mathcal{L}$ but $\psi\zeta \notin \mathcal{L}$. But $\lambda^{\star(\kappa_{0}, \xi\zeta)} = \lambda^{\star(\kappa_{0}, \psi\zeta)}$. Lorem ipsum.. □

Chapter 2: Turning Contraptions (TCs)

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.

2.1 Preamble

Lorem ipsum dolor sit amet. Lorem ipsum dolor sit amet. Lorem ipsum dolor sit amet.

Lorem ipsum dolor sit amet. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.

> Lorem ipsum dolor sit amet, consectetur adipiscing elit.

2.1.1 Lorem ipsum dolor sit.

Ponder 2.1.1

Attempt 1: Lorem ipsum dolor sit amet, consectetur adipiscing elit. **Problems:**

- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.
- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor.

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

> Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor.

Ponder 2.1.2

Attempt 2: Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore.

```
SQUAWK 0:
  switch char:
    case 'x':
      print 'y';
      HOP LEFT;
      goto SQUAWK 2;
    case 'y':
      ...
    ...
  ...
```

Lorem ipsum dolor.

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore.

2.1.2 Lorem ipsum dolor sit amet.

Ponder 2.1.3

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat voluptatem. Ut enim aeque doleamus.

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.

- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor.
- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore.
- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam.
- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.
- Lorem ipsum dolor sit amet.
- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.
- Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore.

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.

2.1.3 Key Differences Between USPs and TCs

USPs

- Lorem ipsum dolor sit amet.
- Lorem ipsum dolor sit.
- Lorem ipsum dolor.
- Lorem ipsum dolor sit.

TCs

- Lorem ipsum dolor sit amet, consectetur.
- Lorem ipsum dolor sit.
- Lorem ipsum dolor sit.
- Lorem ipsum dolor sit amet, consectetur adipiscing.

2.2 Formal Definition of TCs

Definition 2.2.1

A Turning contraption can be described by a 7-tuple $\mathcal{W} = \left(Z, \Xi, \Psi, \zeta, q_{\text{zap}}, q_{\text{yell}}, q_{\text{boom}}\right)$

- Z is the set of Lorem ipsum.
- Ξ Lorem ipsum dolor sit. $\pi \notin \Xi$
- Ψ Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam. $\Xi \supseteq \Psi \wedge \pi \in \Psi$
- $\zeta : \left(Z \setminus \left\{q_{\text{yell}}, q_{\text{boom}}\right\}\right) \times \Psi \to Z \times \Psi \times \{\leq, \to, :)\}$ the transition function
- $q_{\text{zap}} \in Z$ Lorem ipsum dolor sit amet.
- $q_{\text{yell}} \in Z$ Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor.
- $q_{\text{boom}} \in Z$ Lorem ipsum dolor sit amet., it must be that $q_{\text{boom}} \neq q_{\text{yell}}$

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat voluptatem. Ut enim aeque doleamus.

Note 2.2.1

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore.

2.3 Universality of Computation

2.3.1 Universal Contraptions

Definition 2.3.2

A universal contraption is a contraption that can Lorem ipsum dolor sit amet..

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat voluptatem. Ut enim aeque doleamus.

2.4 Decidability

Definition 2.4.3

A **Rectanglable gibberish** Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor.:

- $\exists \omega, \forall L$, M halts and bleeps ω
- $\exists \omega, \forall L$, M halts and bloops ω

In which case we call M a **decider** for L. We write DEC to indicate the set of all Rectanglable gibberish.

Example 2.4.1

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore.

Proof.

```
def M_foo(k: int):
  if k == 31:
    return 532
  for j in [1, 2, ..., k]:
    if k // j == 1324123:
      return 4
  return 1
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore. □

Example 2.4.2

Deciding behaviour of USPs

- GLORP_USP $= \{\langle D : \text{USP}, x : \text{blorp}\rangle \mid D \text{ glorps } x\}$ Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do.
- FLARP-GLORPS_USP $= \{\langle D : \text{USP}\rangle \mid D \text{ glorps } \langle D\rangle\}$ Lorem ipsum dolor sit amet.
- SQUISH_USP $= \{\langle D : \text{USP}\rangle \mid D \text{ is squishable}\}$ Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor.
- ZORP_USP $= \{\langle D\_1, D\_2\rangle \mid \mathcal{L}(D\_1)! = \mathcal{L}(D\_2)\}$ Lorem ipsum dolor sit amet, consectetur adipiscing elit.

Proving that NEQ $*$ USP is Rectanglable by reduction.

Proof. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat. □

2.4.1 Closure Properties of Rectanglable Gibberish

Theorem 2.4.1

Rectanglable gibberish is closed.

Proof. Lorem ipsum dolor sit amet, consectetur adipiscing elit.

```
fun dunno(x) =
  case M1(x) of
    BLEEP => BLEEP
  | BLOOP => BOOM
```

□

2.4.2 Semi-Decidability

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore.

Definition 2.4.4

A TC M **rectangles** L if: Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore.

Corollary 2.4.1

Lorem ipsum dolor sit amet, consectetur adipiscing elit.

Theorem 2.4.2

A gibberish $\mathcal{Z}$ is π-squared iff both $\mathcal{Z}$ and $\mathcal{Z}^{\nabla}$ are semi-$\dot{\pi}$-bleepable. Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magnam aliquam quaerat.