

Programming With Matrix



<https://github.com/kennytilton/todomx>

Another school of thought...



No comment.



“If it isn't fun, you're doing the wrong technology.”



Ivan Sutherland in 1963

“Oh, you mean the
programmer
experience?”

“Lisp and SmallTalk ...were obviously written by people trying to write programs *for people*.”



Rich Hickey, ClojureConj 2017

Automatic State Management

$$d \leq \sim (f d^*)$$

$$d \leq x$$

$$\text{Side } f/x \leq \sim d$$

(examples next)

Our Wins

- GUI geometry made trivial
- Yes Silver Bullet
- The Grail of Object Reuse
- Efficiency for free
- Callback Hell eliminated
- RxJS for free
- Web Components for free
- Web framework not needed





Show Time

Matrix • RTrak™

file:///Users/kennethilton/todomx/cljs/todomx/index.html#/

Apps KT 29 cfi GDocs Search Prospects Applied !!!!! Other Bookmarks

RTrak

Feb 01 2018

▼ |What are you taking?

<input type="radio"/> L-tryptophan	01/19/2018
View Adverse Events	
<input checked="" type="radio"/> Ibuprofen	01/21/2018
View Adverse Events	
<input type="radio"/> SAM-e	mm/dd/yyyy
View Adverse Events	
<input type="radio"/> Probiotics	mm/dd/yyyy
<input type="radio"/> St John's Wort	mm/dd/yyyy

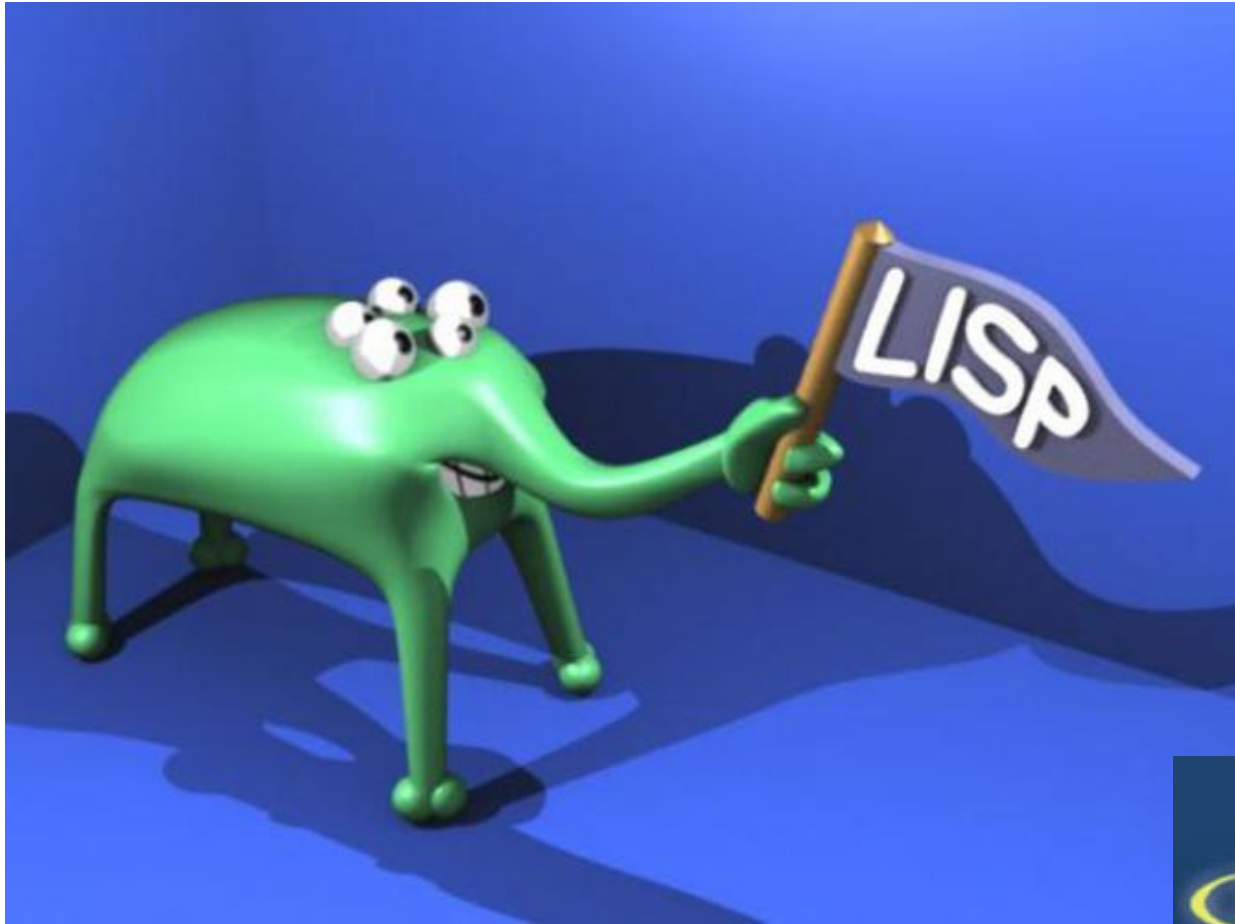
☒ Auto-check AEs?

4 items remaining

All Active Completed

Clear completed

Pardon My Code



QooXDoo
UNIVERSAL JAVASCRIPT FRAMEWORK

Automatic State Management

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Side $f/x \leq \sim d$

```
(defn todo-list-item [me todo matrix]
  (li
    {:class (c? #{(when (<mget me :completed)
                        "completed"))})
    {:completed (c-in false)}
    ...LI children...))
```

Extra-Matrix Inputs

$d \sim (f d^*)$

$d \leq x$

Side $f/x \sim d$

```
(input {:class "toggle"  
      ::tag/type "checkbox"  
      :onclick #(mswap!> td :completed  
                        #(if % nil (now)))})
```

Automatic Extra-Matrix Propagation

$d \leq x$
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Side $f/x \leq \sim d$

```
(defmethod observe-by-type [:tiltontec.tag.html/tag] [slot me newv oldv c]
  (let [dom (tag-dom me)]
    (some #{slot} (:attr-keys @me))
    (case slot
      :style (set! (.-style dom) (style-string newv))

      :hidden (set! (.-hidden dom) newv)

      :class (classlist/set dom (if (coll? newv)
                                     (str/join " " newv)
                                     Newv))

      :checked (set! (.-checked dom) newv)
      (do
        (p!n :obs-by-type-genset slot newv)
        (.setAttribute dom (name slot) newv))))))
```


Automatic State Management

Global data visibility (and Matrix XHR)

```
(defn ae-explorer [todo]
  (button {:class "li-show"
           :style (c? (or (when-let [xhr (<mget me :ae)]
                           (let [aes (xhr-response xhr)]
                             (when (= 200 (:status aes))
                               "display:block"))
                           "display:none"))
           :onclick #(js/alert "Feature not yet implemented.")}

    {:ae (c? (when (<mget (mxu-find-class me
                                         "ae-autocheck") :on?)
                  (send-xhr
                   (pp/cl-format nil ae-by-brand
                                (js/encodeURIComponent
                                 (td-title todo)))))))}

    (span "View Adverse Events")))
```

Why “Matrix”?

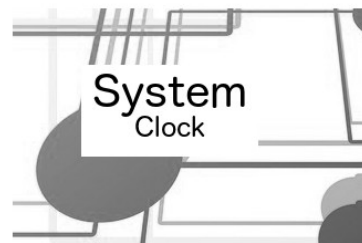
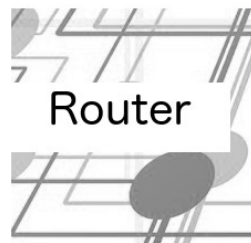
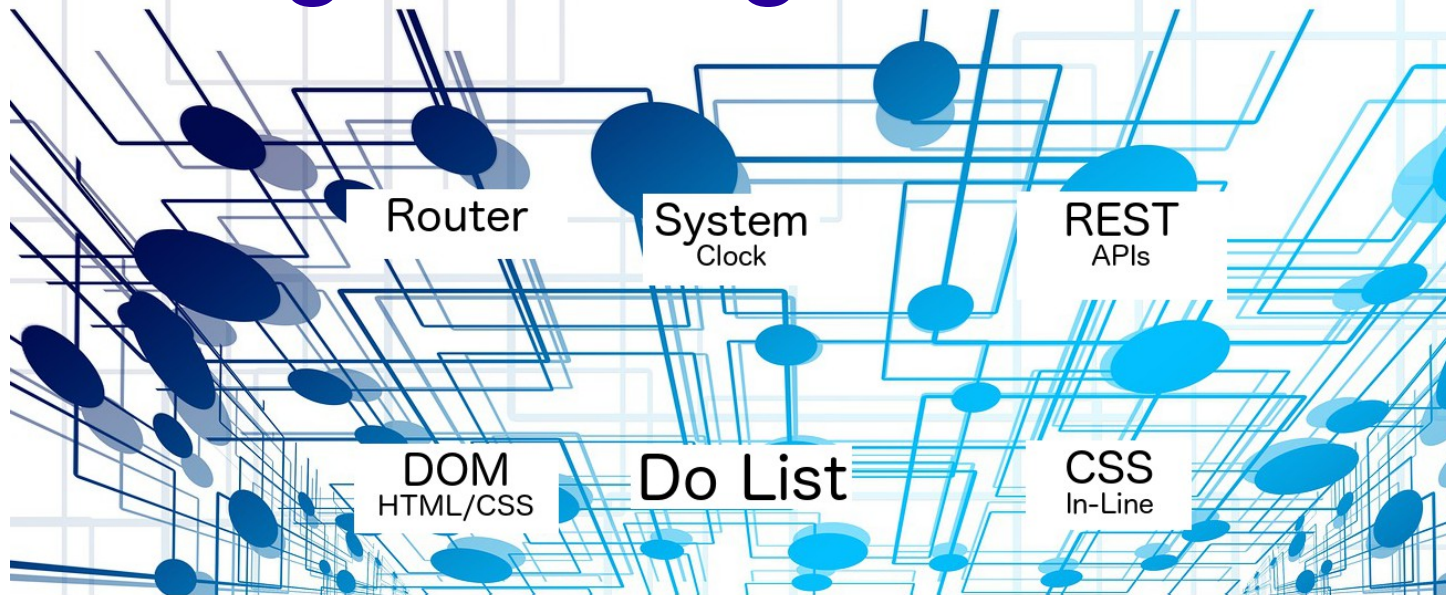
(Forget the movie.)

ma·trix 'mātriks noun

An environment in which something else takes form. Origin: Latin, female animal used for breeding, parent plant.

From *matr-*, *mater*.

Programming with Matrix



70kloc Lisp Existence Proof

tilton's algebra

Welcome, tilton! (8165 points)  

[Feedback](#)  

tilton's algebra

Welcome, tilton! (8171 points)  

[Home](#) > [Notebook](#) > [Freestyle](#) >

[Session count](#) [Feedback](#)  

Wc

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Post

Synopsis Stuck on inequality

Tags

Insert:    



Article

Regarding this problem:

$$\begin{aligned} -3x - 2 &> 13 \\ -3x &> 15 \\ x &> \frac{15}{-3} \end{aligned}$$

Yo, what gives?! STupid computer says this is wrong.

The Programmer Experience

- Declarative, functional state.
- Maintained current for me.
- Right down to the individual property.
- Small rules easy to get right. Or debug.
- Easy to reach the data I need to write a rule.
- Covering everything.
- No pub/sub wiring overhead.
- I just write functions.
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Programming With Matrix



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Questions?



This is the late Swiss Alpinist Erhard Loretan. He climbed everything in the world solo, without oxygen, and faster than anyone had before.

He died climbing while roped together with his less experienced life partner, who slipped and fell dragging them both two hundred meters down the mountain. Only she survived.

German climbers Reinhold Messner and Peter Habeler pioneered this style which relied on skill and stamina. They have retired safely.

Another Swiss climber following this style was Ueli Steck, who died in May climbing solo. How he fell is unknown.

Another school of thought...



No comment.



BUCHNER, ROLF/GETTY IMAGES

“If it isn’t fun, you’re doing the wrong technology.”



Ivan Sutherland in 1963

Ivan Sutherland

His thesis based on SketchPad, with Claude Shannon (!) as his advisor:
<https://www.cl.cam.ac.uk/techreports/UCAM-CL-TR-574.pdf>

Also in the talks directory in my TodoMX repo.

A wonderful video deomstrating SketchPad and the first “mouse”, a light pen:
https://youtu.be/USyoT_Ha_bA



“Oh, you mean the
programmer
experience?”

In May my last boss and I were kicking around whether to use my framework or an established CLJS web framework. I expressed my doubts about the complexity of one of them.

“We thought the example code was pretty readable when we looked at it,” he said.

“I am talking about writing the code.”

“Oh, you mean the programmer experience,” he asked.

“Lisp and SmallTalk ...were obviously written by people trying to write programs *for people*.”



Rich Hickey, ClojureConj 2017

The leadup begins here:

<https://youtu.be/2V1FtfBDsLU?t=59m23s>

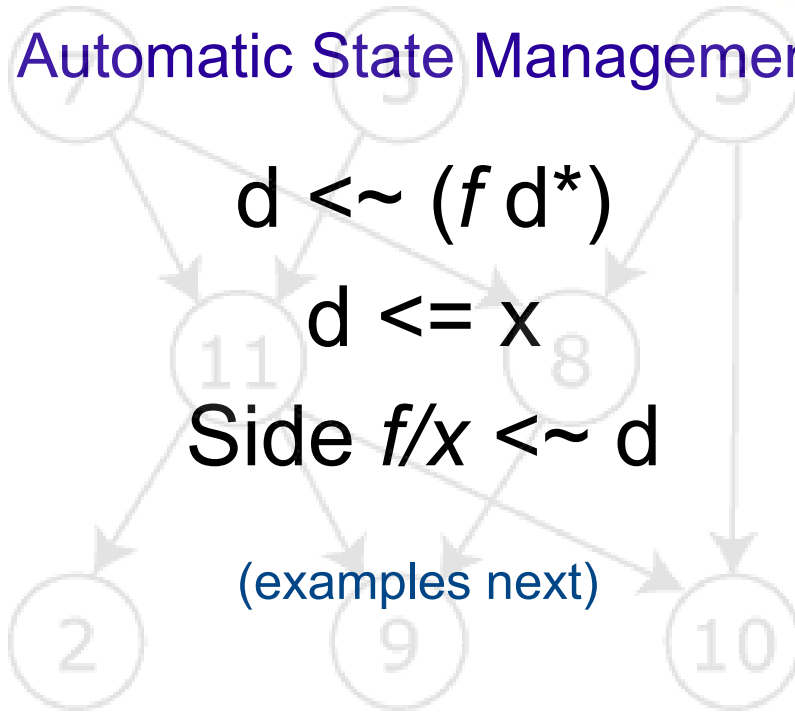
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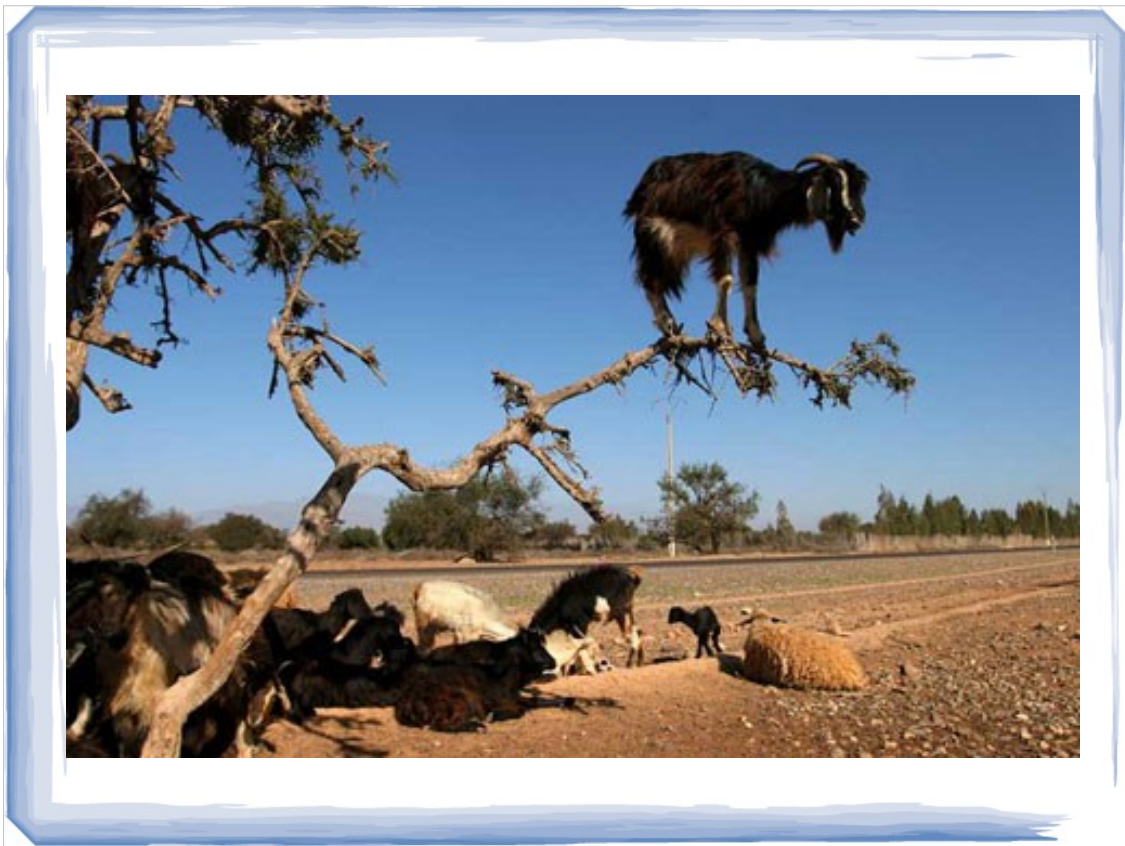


The GUI geometry problem led me to Cells. That story is here:

<http://smuglispweeny.blogspot.com/2017/06/the-making-of>

I love that Sean Parent of Adobe was working on the same problem and came up with Adam, their C++ reactive hack. Look for “Property model” here:

http://stlab.adobe.com/group__asl__overview.html



Google “Tree climbing goats Morocco”.

Show Time

The screenshot shows a web browser window with the RxTrak application. The browser's address bar displays the file path: `file:///Users/kennethilton/todomx/cjs/todomx/index.html#`. The RxTrak logo is visible at the top of the application. Below the logo, the date "Feb 01 2018" is shown, followed by a dropdown menu with the text "What are you taking?". A list of medications is displayed, each with a radio button, a "View Adverse Events" link, and a date field. The medications listed are L-tryptophan, Supradin, SAM-e, Probiotics, and St John's Wort. The date fields for L-tryptophan and Supradin are filled with "01/19/2018" and "01/21/2018" respectively, while the others are empty. At the bottom of the list, there is a checkbox for "Auto-check AEs?".

Medication	View Adverse Events	Date
<input type="radio"/> L-tryptophan	View Adverse Events	01/19/2018
<input checked="" type="radio"/> Supradin	View Adverse Events	01/21/2018
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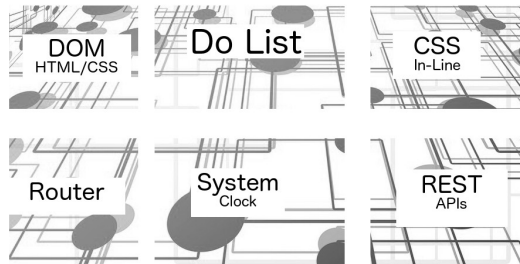
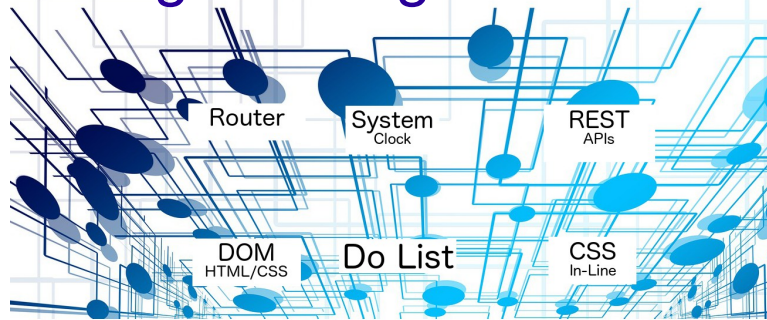
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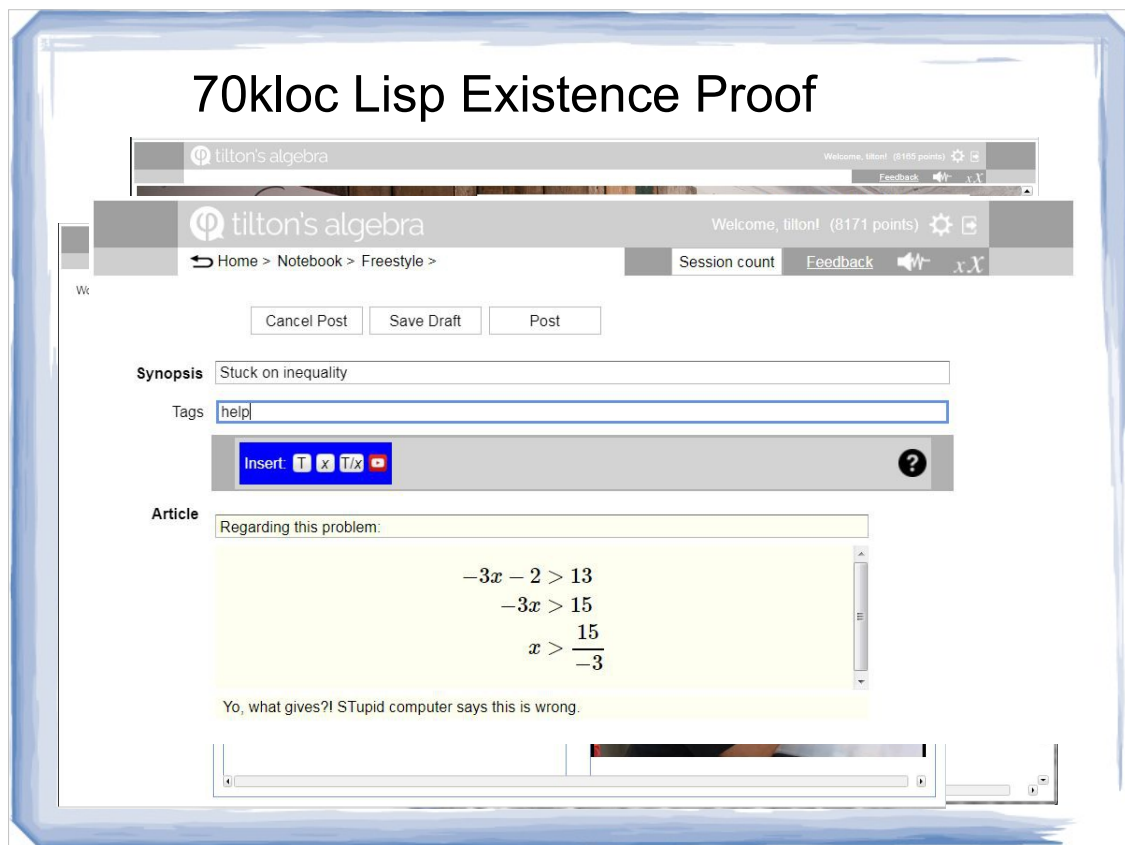
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The Algebra app is at <https://tiltonsalgebra.com/#>

A second enterprise Lisp system leveraging dataflow all the way down to the persistent CLOS database is described here:

<http://smuglispweeny.blogspot.com/2008/03/my-biggest-lisp-project.html>

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