MAKE WEB UI EASY WITH LEPTOS

:%S/EASY/EASIER

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SOCIALS

My Blog
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I've been a web developer for four years now, building high performance ecommerce and bespoke websites.

My first PR to Leptos was 15 months ago
Note: Leptos has existed for 16.5 months
SHOUTOUT TO GREG

Creator of Leptos

Ben Wishovich | @benwis@hachyderm.io
"FRONTEND IS MORE COMPLICATED THAN BACKEND"

-- DEVELOPERS

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- actually, front end is more complicated then backend

- who made it more complicated?

- who made it more complicated, huh? WHO?!
Leptos

is a full-stack web framework that lets you leverage the power of Rust and fine-grained reactivity to deliver interactive, stable, and powerful web applications.

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LEPTOS DESIGN PRINCIPLES

1. Stability and performance
2. It should feel like a Rust app
3. Compile time, not run time
4. Keep it simple, but customizable
5. HTML-first + progressive enhancement

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WEBASSEMBLY FRAMEWORK

• Anything that needs to happen in the browser will be compiled to Webassembly and run by the browser
CLIENT SIDE RENDERING

Serve a basic html template and JS file that loads our webassembly, which builds the page and runs async functions

Navigation occurs on the client

```html
<!DOCTYPE html>
<html>
  <head>
    <script type="module">
      import init from '/hackernews_axum-485cb1406e801850.js';
      init('/hackernews_axum-485cb1406e801850_bg.wasm');
    </script>
    <link rel="stylesheet" href="/style-1afa1e6340fa40c3.css"/>
    <link rel="preload" href="/hackernews_axum-485cb1406e801850_bg.wasm" as="fetch" type="application/wasm" crossorigin=""/>
    <link rel="modulepreload" href="/hackernews_axum-485cb1406e801850.js"/>
  </head>
  <body>
  <!-- deleted Trunk reloading websocket code -->
  </body>
</html>
```
SERVER SIDE RENDERING

Dynamically render HTML on the server and send it to the browser, populating it later with results from the server. Navigation typically occurs on the client.

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Show HN: Jampack – Optimizes static websites as a post-processing step (github.com)
by georges_gomes 4 hours ago | 28 comments

See a Fish? Ring the Bell (visdeurbel.nl)
by cyranban 2 days ago | 20 comments

Solving Crew Battle Strategy with Math (alexirpan.com)
by alexmolas an hour ago | 1 comments

Show HN: Nano-web – a low latency one binary webserver designed for serving SPAs (github.com)
by antipher 5 hours ago | 64 comments

William Adams: English Advisor to the Shogun (historytoday.com)
by lermonth 3 days ago | 11 comments

Ugly Avatar (txstc55.github.io)
by unobtayavar 11 hours ago | 23 comments

Using ITAG to dump parallel NOR flash (zetier.com)
LET'S BUILD

A BASIC COUNTER APP WITH LEPTOS

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STARTING OFF

- Even More Basic Starter
CONGRATULATIONS!

We built the Leptos Axum Starter

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TEMPTING YOU

CAN I TEMPT YOU?

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MYTHS OF LEPTOS AND WEBASSEMBLY

1. The bundle size is too big
2. The startup time is too slow
3. It's limited by a lack of direct DOM access for Webassembly
4. Compiling takes too long

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PERFORMANCE
# JS Framework Bench

**GOSIM 2024 EUROPE**

<table>
<thead>
<tr>
<th>Name</th>
<th>Duration for...</th>
<th>varnish</th>
<th>Battles-v.0.9.0-nose-25</th>
<th>battles-v.1.8.0</th>
<th>battles-9.7</th>
<th>sludge-hammer-v-7.0.0</th>
<th>lepton-6.7</th>
<th>lepton-v.0.8.9</th>
<th>angular-ringfor-v-17.0.2</th>
<th>react-hocks-v-16.0.0</th>
<th>spinre-v.8.12.0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Implementation notes</td>
<td></td>
<td>code</td>
<td>code</td>
<td>code</td>
<td>code</td>
<td>code</td>
<td>code</td>
<td>code</td>
<td>code</td>
<td>code</td>
</tr>
<tr>
<td></td>
<td>create rows</td>
<td>creating 1,000 rows (100 rows per task)</td>
<td>30.9±1.2</td>
<td>35.3±1.2</td>
<td>36.4±1.1</td>
<td>36.8±1.1</td>
<td>38.9±1.2</td>
<td>42.7±1.1</td>
<td>41.5±1.0</td>
<td>42.9±1.1</td>
<td>43.1±1.4</td>
</tr>
<tr>
<td></td>
<td>replace all rows</td>
<td>updating all 1,000 rows (100 rows per task)</td>
<td>37.6±1.3</td>
<td>40.2±1.3</td>
<td>40.1±1.3</td>
<td>40.6±1.3</td>
<td>46.8±1.3</td>
<td>47.9±1.3</td>
<td>47.7±1.3</td>
<td>50.4±1.3</td>
<td>60.8±0.8</td>
</tr>
<tr>
<td></td>
<td>partial update</td>
<td>updating every 10th row</td>
<td>15.1±1.2</td>
<td>16.0±1.2</td>
<td>16.1±1.2</td>
<td>16.3±1.2</td>
<td>16.6±1.2</td>
<td>16.6±1.2</td>
<td>18.5±1.2</td>
<td>18.7±1.2</td>
<td>20.4±0.5</td>
</tr>
<tr>
<td></td>
<td>select row</td>
<td>highlighting a selected row (10 rows per task)</td>
<td>6.4±0.1</td>
<td>7.5±0.1</td>
<td>7.7±0.1</td>
<td>8.5±0.1</td>
<td>11.0±0.1</td>
<td>12.2±0.1</td>
<td>12.4±0.1</td>
<td>14.2±0.1</td>
<td>15.5±0.1</td>
</tr>
<tr>
<td></td>
<td>swap rows</td>
<td>swap 2 rows for table 1,000 rows (2 rows per task)</td>
<td>18.6±1.2</td>
<td>19.5±1.2</td>
<td>19.7±1.2</td>
<td>19.4±1.2</td>
<td>19.4±1.2</td>
<td>19.3±1.2</td>
<td>21.0±1.2</td>
<td>165.2±10.2</td>
<td>159.4±6.6</td>
</tr>
<tr>
<td></td>
<td>remove row</td>
<td>removing one row (10 rows per task)</td>
<td>15.5±1.2</td>
<td>16.0±1.2</td>
<td>15.9±1.2</td>
<td>16.2±1.2</td>
<td>16.0±1.2</td>
<td>16.1±1.2</td>
<td>18.5±1.2</td>
<td>18.6±1.2</td>
<td>18.0±1.1</td>
</tr>
<tr>
<td></td>
<td>create many rows</td>
<td>creating 10,000 rows (100 rows per task)</td>
<td>304.8±1.3</td>
<td>373.2±1.3</td>
<td>376.2±1.3</td>
<td>381.1±1.3</td>
<td>423.9±1.3</td>
<td>444.5±1.3</td>
<td>432.4±1.3</td>
<td>441.3±1.3</td>
<td>587.6±4.4</td>
</tr>
<tr>
<td></td>
<td>append rows to large table</td>
<td>inserting 1,000 rows (5,000 rows per task)</td>
<td>39.2±1.3</td>
<td>41.5±1.3</td>
<td>41.3±1.3</td>
<td>41.6±1.3</td>
<td>46.5±1.3</td>
<td>46.2±1.3</td>
<td>47.2±1.3</td>
<td>48.5±1.3</td>
<td>49.5±1.3</td>
</tr>
<tr>
<td></td>
<td>clear rows</td>
<td>clearing a table with 1,000 rows (1 row per task)</td>
<td>12.3±1.1</td>
<td>13.5±1.1</td>
<td>14.1±1.1</td>
<td>14.0±1.1</td>
<td>16.6±1.1</td>
<td>15.9±1.1</td>
<td>15.5±1.1</td>
<td>26.7±1.1</td>
<td>25.3±0.9</td>
</tr>
<tr>
<td></td>
<td>aggregate performance</td>
<td>of all factors in the table</td>
<td>compare</td>
<td>compare</td>
<td>compare</td>
<td>compare</td>
<td>compare</td>
<td>compare</td>
<td>compare</td>
<td>compare</td>
<td>compare</td>
</tr>
</tbody>
</table>
BEN'S BLOG PERFORMANCE TEST

- Wrote my blog in two different web frameworks as similar as possible, Remix and Leptos
- Measure how long it takes to serve the home page using each framework, under differing levels of load

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Details

- Home page fetches 3 most recent posts from a sqlite database, displays post metadata
- Html/CSS/Logic as functionally similar as possible
TEST HARDWARE

Web apps run on a Digital Ocean VM with:

- Two dedicated AMD "vcpus"
- 4GB RAM
- 2Gbps bandwidth

Load tester run on equivalent VM, using vegeta

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LEPTOS V0.6 + AXUM

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TAKEAWAYS

• ~50% reduction in page load time
• 3x-10x increase in traffic handled
RUST'S TYPE SYSTEM AND TOOLING

- Types across the boundary between Client and Server
- Types at compile time and run time
- Cargo, cargo-leptos, and rustfmt vs Eslint/Prettier/Npm/tsc/vite/etc.

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DEVELOPER TIME

- The more work the tooling does, the less the programmer needs to keep things in their head
- Simplifies building and maintaining your codebase
The rust part of it + reactivity brings amazing benefits to making sure that we spend (a little bit) more time building our application and almost no time debugging the version that's already running. So most of our time is spent on building new features and focusing on the product / user experience rather than fixing bugs and pushing patches. - Rakshith Ravi - VP Engineering, Patr

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Having a language built with a type system from the beginning combined with a framework that is competitive with modern JS frameworks and all of the use cases that implies means that I can build comparable sites to what I've done my entire career with far less cognitive overhead. - Chris Biscardi, Rust Adventure
Leptos is essentially taking all the benefits of Rust and marrying them to all the benefits of Signals & SSR... I have done truly nothing to optimize yet and I already have top notch time to paint and time to reactive. Even on poor LTE beaches. - Alex, CBVA
ECOSYSTEM AND COMMUNITY

SHOUTOUT TO THE LEPTOS DISCORD

AWESOME LEPTOS

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COMING SOON - LEPTOS 0.7

- Complete reactive system rewrite
- Make reactive system modular
- Ergonomic improvements for async data loading

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TEMPTED YET?

1. Server functions
2. Performance
3. Infra costs
4. Rust's type system, error messages, and tooling
5. Reduced developer time vs app complexity

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JOIN US

LEPTOS WEBSITE: HTTPS://LEPTOS.DEV

DISCORD

GITHUB

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THE END

QUESTIONS?

PS: Come find me if you'd like to chat and/or if you'd like some Leptos stickers

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