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BUILD WEBASSEMBLY APPS WITH RUST AND LEPTOS

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Learn More About Leptos

Leptos Book

by Leptos Programming Team

Website: https://leptos.dev

Online Book: https://book.leptos.dev

GitHub Repo: https://github.com/leptos-rs/book

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Goals for this Session

- What is Leptos?
- Full-Stack Web Programming
  - Rust on the Server
  - Rust on the Client
- Rust and WebAssembly
- Leptos and Other Frameworks

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Leptos

- Leptos is a full-stack programming environment that uses Rust for both server and client
- Leptos uses Server Functions for the server and Components for the client
- Leptos provides:
  - Server-Side Apps progressively enhanced with Client-Side Interactivity
  - Simple Tooling with Minimal Configuration
  - Reactive Signals for State Management
  - Rust's Type and Memory Safety Protections
- Leptos is similar to Next.js/React (JavaScript) and Blazor (C#)

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Server-Side Rust

- Leptos implements Server Functions with Actix Web or Axum
- Actix Web is a powerful, pragmatic, and extremely fast web framework
- Axum is a web application framework that focuses on ergonomics and modularity
- Server Functions are an alternative to REST APIs and GraphQL
- Server Functions
  - Co-located with component code
  - Isomorphic and can be called from the client or server

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Client-Side Rust with WebAssembly

- Leptos Components are written in Rust and compiled to WebAssembly
- View Macros are used to create HTML Elements of the Components
- Components are
  - Similar to React Components and Blazor Components
  - Support reactivity and state management using signals
  - Are isomorphic and can be rendered on the server or client

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WebAssembly

- WebAssembly is:
  - a binary instruction format for a stack-based virtual machine
  - available in all modern web browsers on all platforms
  - a portable compilation target for programming languages
  - efficient, fast, and safe
- WebAssembly is not:
  - a replacement for JavaScript
  - a new language
  - a new framework
- Languages for targeting WebAssembly: C, C++, Rust, Go

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WebAssembly

- WebAssembly has been gaining popularity with frameworks such as ASP.NET Blazor (Microsoft's new component-based UI framework powered in the browser by WebAssembly)
- Other Languages that are now supporting WebAssembly
  - Pyodide: https://github.com/pyodide/pyodide
  - Java: https://teavm.org/
- More Information about WebAssembly: https://webassembly.org/
- Compiling Rust to WebAssembly: https://developer.mozilla.org/en-US/docs/WebAssembly/Rust_to_wasm

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Programming Demo

Let's Explore Leptos

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Leptos Programming Next Steps

- Read the Leptos Book and Docs
- Try out the Leptos Examples
- Run the code from the webinar as GitHub Codespace and explore it on your own
- Incorporate it into your next project!

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Download the Code

github.com/cc-xebia-webinars/leptos-webinar_04232024

slides and source code available

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Q&A

Questions?

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Thank you!

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