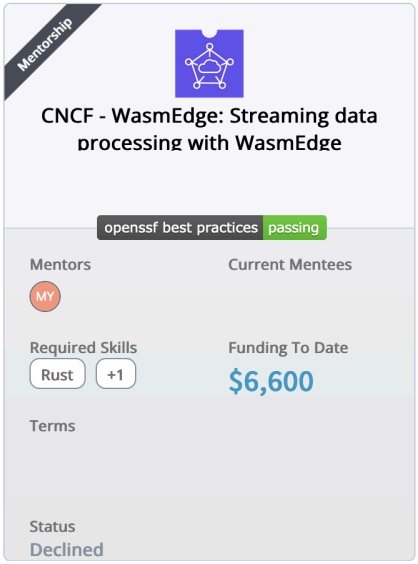
Hrushikesh Rao Naidnur - CNCF WasmEdge LFX 2023 Experience

I am pursuing Bachelors in Computer Science from Jawaharlal Nehru Technological University Hyderabad. I was fascinated by the challenges WebAssembly aims to solve and wanted to be part of the community. I applied for CNCF LFX WasmEdge in Fall 2023 to work for WasmEdge Organization. To get myself involved I familiarized myself with Rust Programming, webassembly format, WasmEdge Runtime.

My Selection Story:

WasmEdge stands out as a WebAssembly Virtual Machine designed to be efficient for today's cloud and edge devices. My interest in contributing to WasmEdge grew after exploring the CNCF mentoring repo. WasmEdge follows a pretest approach for selecting mentees, involving straightforward tasks related to the project to assess the candidate's skills. In Spring 2023, I applied for LFX WasmEdge, focusing on the **Streaming Data Processing** project. Although I completed the pretest, I didn't have any contributions to their existing issues.

When the results were out, I didn’t get selected.



Despite not being selected initially, I remained undeterred. With guidance from Michael Yuan, I geared up for the next LFX term, diving deep into the My-Sql-Binlog project. I created a basic Proof of Concept (POC) for reading, processing, and storing SQL binlogs using WasmEdge, I contributed substantially. Although I couldn't participate in LFX Summer 2023 due to a mandatory college internship, my work served as a pretest for other mentees.

Eager to contribute, I applied again for LFX Fall 2023, solving the pretest and, to my joy, securing a spot as a mentee

Hi Hrushikesh!

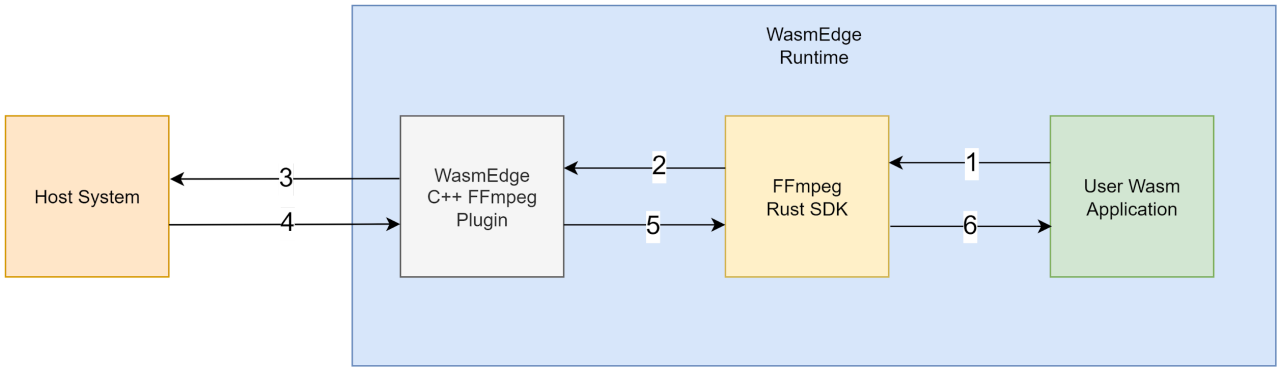
Congratulations!

We are pleased to let you know that you have been accepted as a mentee to the CNCF - WasmEdge: Create a ffmpeg plugin mentorship. The program administrator will contact you with the next steps.

Login To LFX Mentorship

Project:

The aim of the Project was to integrate FFmpeg into WasmEdge as a Plugin. FFmpeg helps process images, videos, audio files useful in machine learning. Compiling FFmpeg to Wasm is possible in Rust, however processing media files was slow due to lack of AVX and limited optimization provided by WebAssembly Runtimes.



To solve this issue, we developed an FFmpeg Plugin in Wasmedge along with Rust SDK. Users can now take advantage of FFmpeg functionalities in Wasm without performance issues. Below is the flow-

1. Wasm Application requiring FFmpeg interact with Rust SDK to perform FFmpeg Functionalities.
2. The Rust SDK takes user inputs and forwards it to WasmEdge C++ FFmpeg Plugin.
3. The Plugin offloads computationally intensive tasks to the host system and returns results back to User Wasm Application

Impact of Project -

1. **Leverage FFmpeg functionalities seamlessly in WasmEdge:** Harness the power of FFmpeg within WasmEdge, achieving near-native performance while processing media files effortlessly.
2. **Accelerate machine learning inference with FFmpeg Plugin in Mediapipe-rs:** Experience a significant boost in machine learning inference speed by utilizing the FFmpeg Plugin within Mediapipe-rs.
3. **Journey of clean code craftsmanship:** Learn how to write clean and maintainable code in Rust, focusing on safe code development and gaining valuable insights.
4. **Safe Code Development:** Handling low-level pointer manipulation memory leaks was challenging. Avoiding null pointers and preventing segfaults posed difficulties. Personally, I learned to design and write clean code, especially when working with safe coding practices in Rust's unsafe environment.
5. **Embrace hassle-free integration with developer-friendly documentation:** Empower developers to seamlessly integrate the Rust SDK with easy-to-understand documentation.

Benefits of LFX Mentorship Program:

- Gain hands-on experience in open source development
- Learn from experienced open source contributors
- Build a network of other open source developers
- Contribute to real-world open source projects
- Get your name out there in the open source community

Conclusion:

My experience with the LFX Project has been nothing short of extraordinary. It has been an incredible opportunity to learn from some of the brightest minds in the open-source community and to contribute to a project that is making a real impact on the world. I am so grateful to the Linux Foundation, CNCF, and WasmEdge for making this experience possible.

Proud of my achievements with the LFX Project! Learned a lot about open-source, Rust, WasmEdge, and FFmpeg. Huge thanks to Michael Yuan and Hydai for their guidance and mentorship. Their expertise has been key to my development journey, offering valuable insights and encouragement.