

Project Proposal: *SignFlow* – Real-Time Sign Language Interpreter for Video Calls

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The Big Picture

Imagine speaking a language most of the world doesn't. Not because you chose to — but because your brain and body work differently. You show up to every meeting, fully present, eager to contribute. But the conversation moves fast. Voices overlap. Smiles appear on faces you can't see clearly. By the time you piece together what was said from fragmented audio, subtitles, and lip movements, your moment to speak has passed.

This is the daily reality for many Deaf and hard-of-hearing individuals — even in 2025. Tools exist, but they're often slow, clunky, or inaccessible. Real-time human interpreters are a luxury not everyone can afford. Automatic captions miss tone, context, grammar — they flatten story into text. Sign language isn't spoken word spelled out — it's rich, visual, expressive, full of emotion and rhythm.

What is *SignFlow*?

SignFlow is our answer: a living bridge between sound and sign.

A **Chrome extension** that listens to a Zoom meeting, converts the audio into text, and then displays sign language gestures live on the screen. It's a respectful effort to bring someone *into* the conversation, not just explain it to them later.

Because understanding shouldn't be a race.

And language should never be a barrier to being seen.

Why *SignFlow* matters?

Research shows that:

- Only 26 % of Deaf and hard-of-hearing adults find live captions “fully effective” during video calls (NDC, 2022).
- Over 60 % lose the thread in fast, multi-speaker meetings without an interpreter (Gallaudet, 2021).
- A delay of just 2–3 seconds causes 78 % to lose contextual understanding (JDSDE, 2020).

These aren't just numbers; they're daily reminders that accessibility is still an after-thought in our “connected” world.

How SignFlow works?

Zoom Audio



Chrome Extension captures it



Backend (AI/ML API + Gemini)

|— Speech-to-Text (Gemini STT)

|— Text Normalization

|— Sign Gloss Conversion

└ Gesture Lookup Query

|— Gloss words



Qdrant finds sign gesture for each gloss



Extension shows sign GIFs one by one

What We Will Build for the MVP

For the hackathon, our MVP will:

- Translate **common phrases** (30–50 basic signs)
- Show **simple GIF animations** (not a 3D avatar yet)
- Work **live during a Zoom meeting**

If someone says:

"Hello everyone, today we have a meeting."

The extension will show the signs:

HELLO → TODAY → MEETING

(I think this will be enough to show the concept.)

Who is SignFlow for?

SignFlow is for Deaf and hard-of-hearing professionals, students in virtual classrooms, patients during tele-health visits, and anyone who simply wants meetings where every voice—spoken or signed—can keep pace with the conversation.

Future Scope

Right now we're using 30–50 basic signs with simple GIFs, but we can add more signs and make the animations smoother, maybe even use a 3D avatar. We can also support multiple sign languages and improve the sentence translation so it feels more natural. Another thing we could do is make it two-way, letting the user sign back using the webcam. There's a lot of ways we can build on this.

Summary

We are building a simple, practical, and powerful tool that can make online meetings accessible to millions. The MVP will demonstrate the concept clearly, and the project has huge potential to grow into a full accessibility platform.

This is not just an AI demo.

This is something that genuinely helps people communicate.