Altavo

HTW BERLIN

Speak silently. Be heard.

Silent Speech Technology

Dr. Timo Stich · CTO, Altavo · 4 November 2026

ABOUT ME

Dr. Timo Stich

NVIDIA → ZEISS → **Altavo · CTO**

> Altavo is a startup based in Germany that builds radar-based silent speech technology.

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SILENT SPEECH

Speaking without making a sound

You articulate as usual, without voicing. The interface reads the movements of speech, not the audio.

Keyboard | Touch | Voice | Gesture | **Silent speech**

Speech is becoming the interface

Like Star Trek: speaking to computers has long been the imagined default.

Conversational AI makes speaking the natural way in – but speaking aloud isn't always possible or wanted.

Real-time and interactive

Speaking, not dictating. The goal is conversation, not typing speed – natural to use, nothing new to learn.

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WHY LEAVE THE AUDIO CHANNEL OUT?

Who has overheard a call on the train they really didn’t want to hear?

Unintended listeners

Open-plan offices, shared spaces, public transport

Noisy environments

Factories, traffic, crowds

Privacy in public

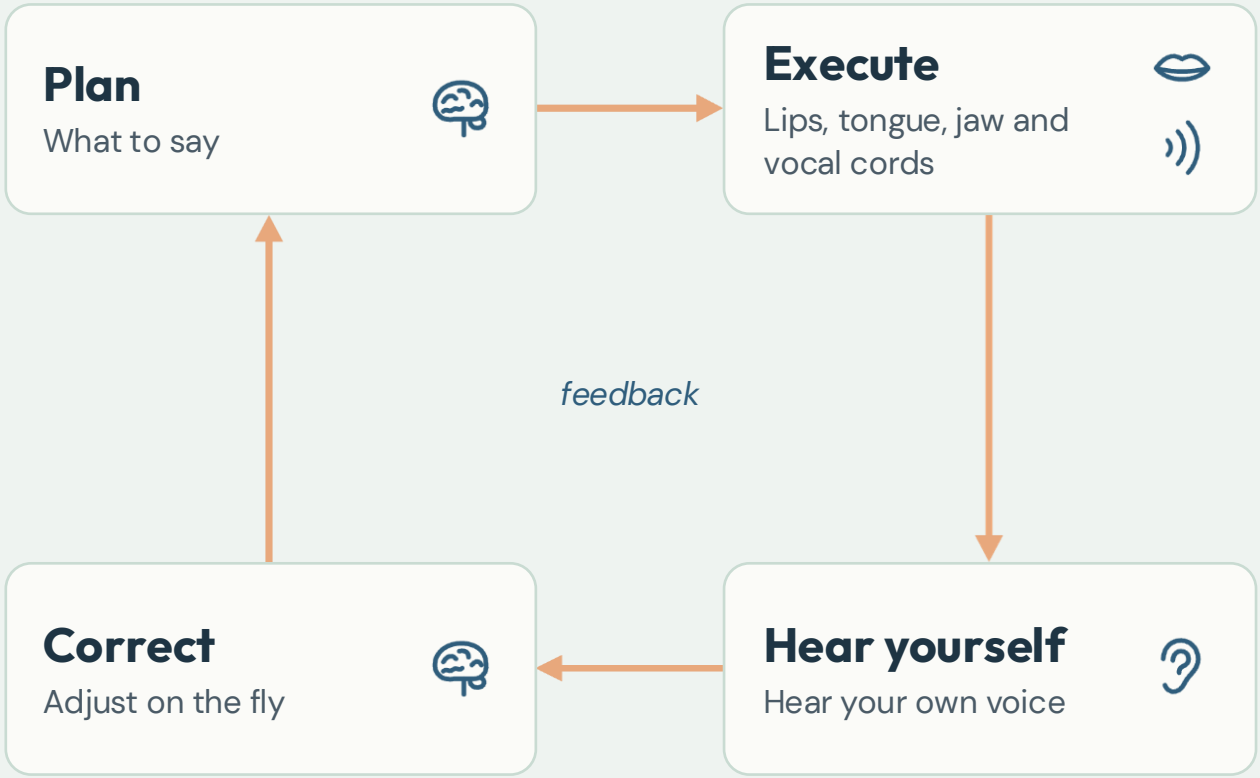
Speaking without being overheard

Input is independent of sound – the **output** can still be voice, text or commands.

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HUMAN MOTOR CONTROL

Speech is a closed control loop



We constantly monitor and adjust our own speech – mostly without noticing.

Guenther, F. H.: Neural Control of Speech, MIT Press, 2016

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HUMAN MOTOR CONTROL

When the loop is disturbed

HEARING DISTURBED

Delayed echo

Your own voice comes back late on a video call – you start to stumble.

HEARING DISTURBED

Loud headphones

You can’t hear yourself – you get louder without noticing.

FEELING DISTURBED

Dental anaesthetic

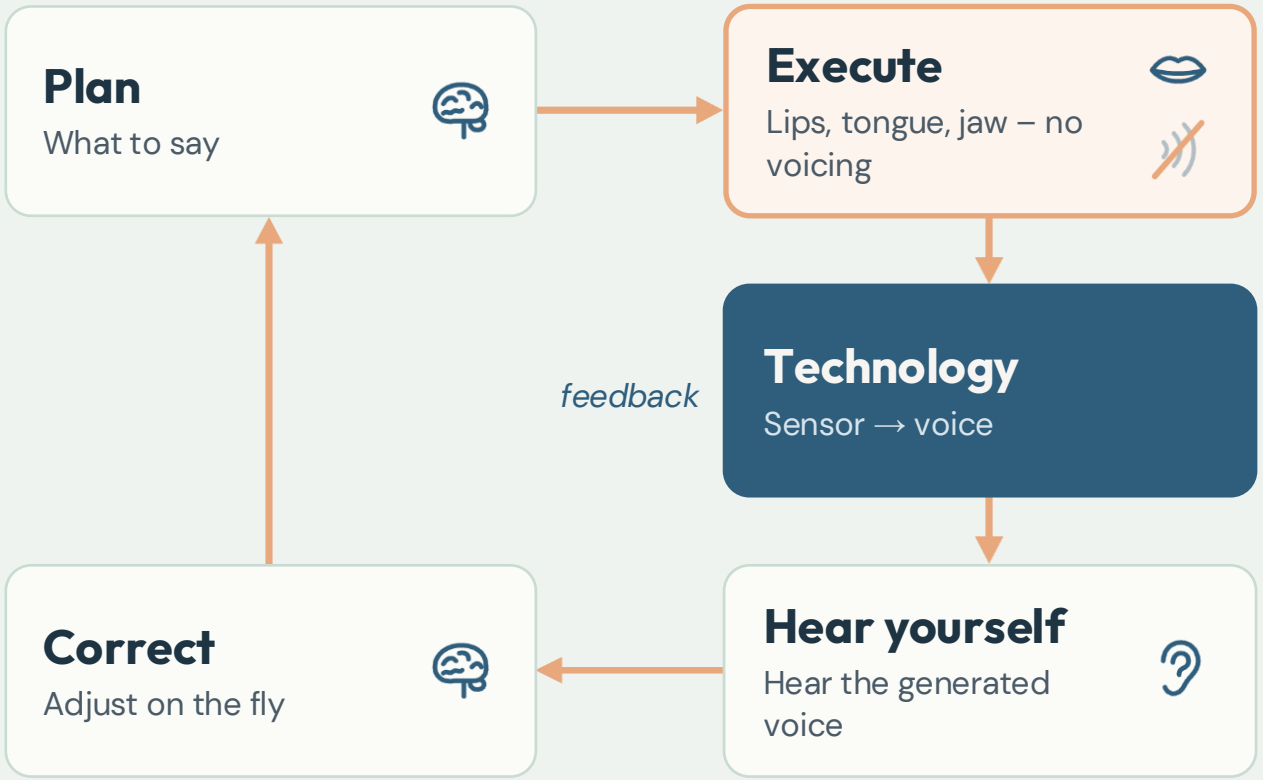
Numb lips, missing feedback – speech turns clumsy, you over-correct.

> We don’t just produce speech – we steer it, continuously, through feedback.

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HUMAN MOTOR CONTROL

Putting technology into the loop



Outside the loop

Dictation, transcription – the result is checked afterwards.

Inside the loop

A real-time voice – the output becomes what the speaker hears and corrects against.

Frank H. Guenther: Neural Control of Speech, MIT Press, 2016

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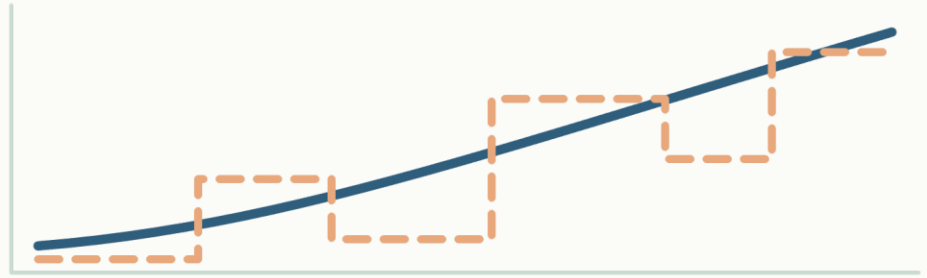
What it takes to be inside the loop

Latency

~70 ms

From movement to sound – any slower and the loop starts to stumble.

Predictability



Smooth: small correction, small change

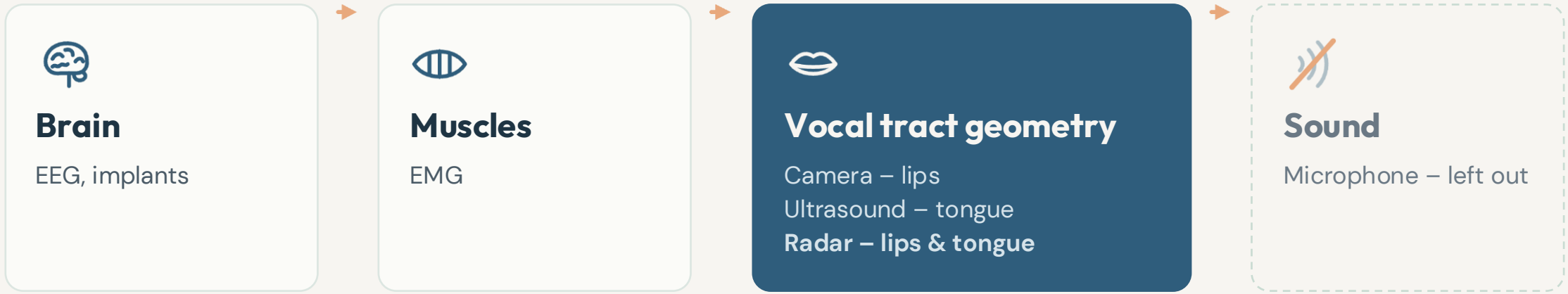
Jumps: small correction, surprising sound

The brain learned to speak in a physical world – the system has to respond like one.

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SENSOR TECHNOLOGY

Where can we measure speech?

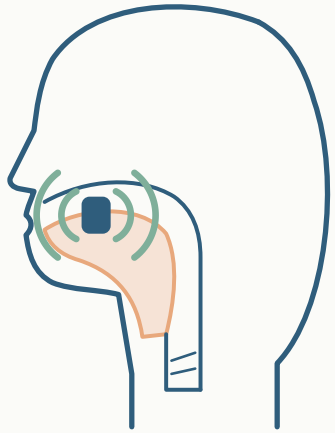


> The geometry of the vocal tract shapes the sound physically which helps predictability for closed loop.

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THE SYSTEM

From signal to voice



AI encoder

From radar signal to articulation

AI decoder

From articulation to sound [1, 2]

Voice

Heard by speaker and listener

Real-time by design

Built to run inside the speech loop.

Predictable mapping

A small change in articulation gives a small change in sound.

[1] Krug, Wagner, Birkholz, Stich: Precisely Controllable Neural Speech Synthesis, ICASSP 2025 · [2] Krug et al.: Self-Supervised Solution to the Control Problem of Articulatory Synthesis, Interspeech 2023

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APPLICATIONS

What would you build?

Restoring voice

For people who have lost their voice

Altavo is developing a wearable medical device

Behind a mask

Speaking under masks and protective gear

Talking to AI

Private conversations with your assistant

Your idea?

What changes when speaking needs no sound?

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Thank you

Dr. Timo Stich · CTO, Altavo · timo.stich@altavo.eu · altavo.eu