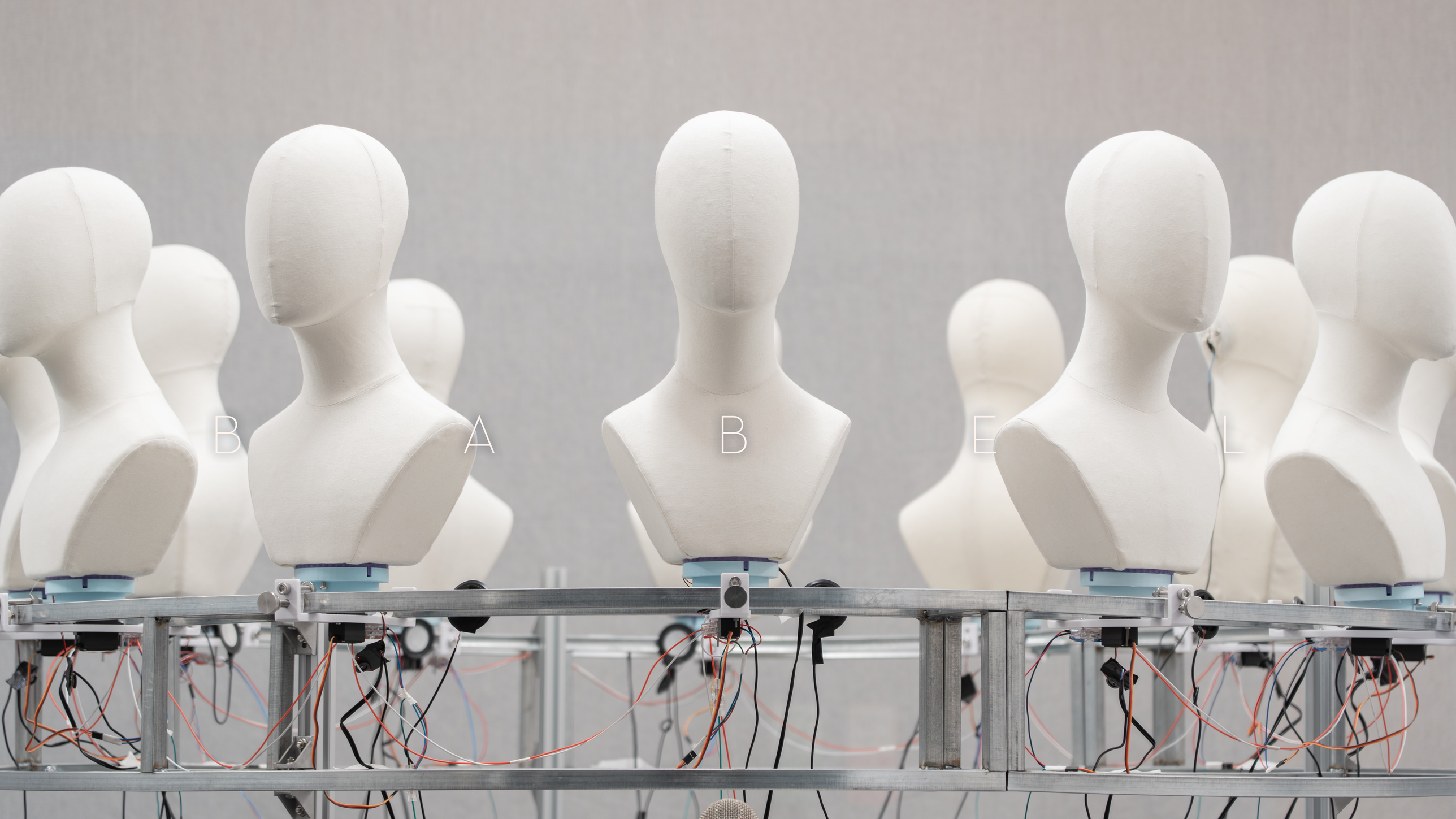

B A B E L

We are all living in a multilingual world. You speak English, I speak Chinese, they speak Spanish. How much of the meaning we yearn to express was lost in the process of language conversion?

When people think in different languages, what is lost in translation cognitively and philosophically? How does this loss shape connection, identity, and creativity?

BABEL visualizes these linguistic and cultural gaps. I created an interactive translation installation in which a sentence is translated sequentially through multiple languages and back to its input language. By tracing this process, the work reveals how language structures thought and how translation is never neutral.

BABEL

Period — Oct 2024 – Nov 2025

Medium — Interactive Installation

Materials — Arduino, Python, Google Cloud API, 12 Mannequin Heads, Metal Ring, Paper

Documentation

https://vimeo.com/1087918452

With Gratitude

Dalin Zang NYU Shanghai IMA

Prof. Inmi Lee NYU Shanghai IMA

Prof. Ian Zhang NYU Shanghai IMA

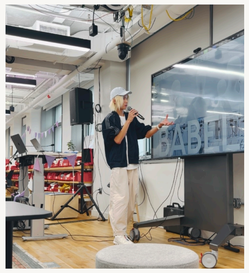
Prof. Andy Garcia NYU Shanghai IMA

Prof. Jung Hyun Moon NYU Shanghai IMA

Prof. Aidan Nelson NYU Tisch ITP/IMA

May 2025, BABEL Solo Exhibition, NYU Shanghai

Oct 2025, NYU Shanghai IMA, NYU Global Show & Tell



Oct 2025, NYU Tisch ITP & IMA, NYU Global Show & Tell

Beyond playful mistranslation, I aim to reveal how language structures thought. For example, in the Acholi language of East Africa, "go west" is expressed as “go north, then left;” Aymara, the indigenous of the Andes, they put the future behind them and face the past. All the languages in the world that have been studied, whether it is English or Chinese, Austronesians or Bantus, can use the phrase “looking forward” to mean facing the future, but the Aymara's mindset allows them to focus more on the past, which is a completely different understanding of time than the rest of the Earth's population. What kind of creative and philosophical thinking does this different understanding of time shape for this people? In addition, the Aymara use ternary logic rather than simple affirmations and negations. This makes me wonder how we can understand the “uncertainty” expressed by the Aymara when we often use translators to talk to them.

CORE QUESTION

If people think in different languages, what gets lost? Not just the sentence itself, but cognitively and philosophically? And how does that loss affect connection, identity, and creativity?

THEORETICAL FOUNDATION

Linguistic Relativity or Sapir–Whorf hypothesis

The structure and classification of languages influence people's habitual thinking, attention, and how they segment the world. Some concepts are very nuanced in one language, but can only be contained within broader terms in another. This is the underlying concept of a work.

LANGUAGE EXAMPLE

- KUUK THAAYORRE
  Uses absolute directions (N, S, E, W) , no relative directions (Left, Right), they are trained to determine direction precisely
- QUECHUA
  speakers seem to represent the past as in front of them and the future as behind them
- AYMARA
  used ternary logic instead of simple yes/no. How will "uncertainty" be understood when we translate?

12

LINGUISTIC AREAS

The structure and classification of languages influence people's habitual thinking, attention, and how they segment the world. Some concepts are very nuanced in one language, but can only be contained within broader terms in another. This is the underlying concept of a work.

API

GOOGLE CLOUD PLATFORM

I used all the languages supported by the Google Cloud Translation & Text-to-speech API. I found significant gaps in representations of Central Asia, Africa, Oceania, and Native American regions. The fact that these languages cannot be represented via the API reflects a bias in technology product development.

≈

BIAS IN TECHNOLOGY

For languages not supported by the Google Cloud API, I analyzed language families and language groups to find the most similar supported languages as alternatives. Future iterations will consider using International Phonetic Alphabet syllables to simulate speech, treating every language equally.

INPUT

“There is no good or bad in the world, it's just how we think.”

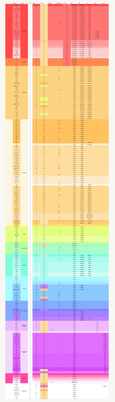
PROCESS

Nta cyiza cyangwa ikibi kiri ku isi, ni uko dutekereza gusa.
Pe tye gin mo maber onyo marac i lobo, tye tam wa keken.
یه تری کی هیڅ سم یا غلط نشته، یواړې زموږ فکرونه دي
Αγαπάω αρχαία ιστορία ὑμῖν, αὐτοὶ καὶ σοί, τοῦ ζητεῖ οἶκαν.
אין נאנו או לא נהנו בעולם, רק תמשבות שלנו
Maailmassa ei ole oikeaa tai väärää, vain mielemme
دونیادا توغرا یاکی خاتا یوق، پەقەت پىزىنىڭ ئەقلىمىزلا بار
ལོག་རྟེན་འདི་ལའང་དགེ་དང་ངན་ཤེས་བྱ་བ་འཁོར་སྐྱེས་དང་མི་འདུ་བ་ཙམ་ཞིག་ཡོད།
လောကမှာ မှန်တာမှားတာ မရှိဘူး၊ ကျွန်ုပ်တို့ရဲ့စိတ်ပဲရှိတယ်
‘Aohe pono a hewa paha ma ke ao nei, o ko kakou mau mana o wale no.
Walang tama o mali sa mundo, tanging ang ating mga iniisip lamang.
Kay pachaqa hukniraymi yuyaykushan, manan allinchu nitaq mana allinchu.

OUTPUT

“The world has a different way of thinking that is neither right nor wrong.”

The colors in the left and right pictures indicate the linguistic regions represented by the 12 heads in BABEL. The order of language regions is based on the order of human migration. In each interaction, the system randomly selects a language from each region.



PROJECT EVOLUTION

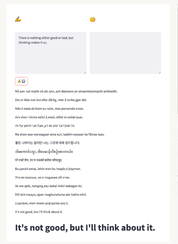
Oct, 2024

NYU Shanghai
IMA
V1 · ARDUINO

Prototype: Map Projection

This prototype allowed viewers to trigger different regions through light input. Interface was projected on the floor. The system would then switch languages accordingly, and once a sentence was typed on the interface, an automatic translation chain began. At this stage, viewers could not clearly perceive how the sentence changed through translations, so the process was too weakened.

ARDUINO | LIGHT SENSOR | PROJECTION | STREAMLIT API



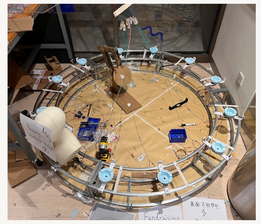
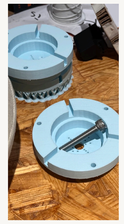
May, 2025

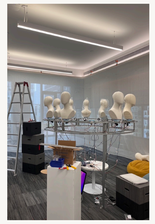
NYU Shanghai
IMA
V2 · ACTUALIZED

Circular Installation: Telephone Game

The project evolved into a complete circular installation: twelve “heads” arranged in a ring, each head representing a specific linguistic region, simulating the cross-regional transmission of a “telephone game.” With Google Cloud Translation and TTS integrated, viewers could hear the breaks and distortions that emerged as language passed through unfamiliar voices.

PYTHON V8 | GOOGLE CLOUD API | SOLO EXHIBITION



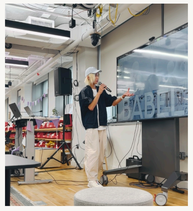
Oct, 2025

NYU Global Show &
Tell, NY & SH
V3 · SUSPENDED

Suspended Structure: Floating Planet

The work was further developed into a suspended structure, using the image of a “floating planet” to strengthen its spatial narrative. A single sentence rotating through the installation symbolizes it goes the Earth's civilization around. Hovering in space, the installation deepened the metaphor of linguistic communities as both isolated from and connected to one another.

PYTHON V12 | GLOBAL EXHIBITION



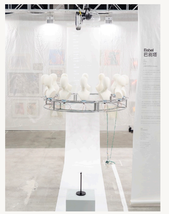
Nov, 2025

West Bund Art
Center, Shanghai
V4 · SCROLL

Rice Paper Scroll: Visible Loss

A Chinese tradition material, rice paper 宣紙 scroll output mechanism was added, allowing the translated text to be continuously “printed” onto paper and made visible. Within a single interaction, viewers encountered three forms of evidence at once: sound, text, and physical trace. Together, they exposed how language gradually drifts, disappears, and is rewritten in the act of transmission.

PAPER SCROLL | PUBLIC EXHIBITION



Next Generation

NYU Tisch IMA
V5 · AI

In the next stage, large language models will be used to interpret each step of the translations. The system will analyze every intermediate translation and generate a short AI reply explaining how meaning drifts, where misunderstanding enters, and why the sentence returns transformed. Printed as a take-away object, this explanation becomes a material trace of linguistic loss and mutation. Or even a satellite in the space.

EVOLUTION

v3.0
Mar 17, 2025 · Shanghai

v8.0
May 19, 2025 · Shanghai

v12.0
Oct 24, 2025 · Shanghai & New York

MEDIA EMPLOYMENT

- 12* Servos
- 12* Speakers
- 2* Projectors
- 1* iMac (with at least 3*USB-C + 1*3.5mm)
- Audio Cables
- Microphone
- Bean Bag Sofa
- Paper Scroll

In building this project, I used Python as the core backend and integrated Google Cloud Translation and Text-to-Speech APIs to construct an automated translation chain. I also used Streamlit for visualization. In addition, I incorporated multiple APIs to shape the project's sound design and used the OpenAI API to enable speech recognition.

INPUT	→	SPEECH-TO-TEXT	→	GOOGLE CLOUD	→	RETURN TO	→	TEXT-TO-SPEECH
Microphone		Voice Detection		Translation API		Origin Language		Audio Output + Print

AI INTERPRETATION

Introducing large language models into the project as an explanatory layer to make the translation pipeline legible to viewers. How semantic drift emerges, where contextual misalignment occurs, and how misunderstanding is produced across languages.

1 SPEECH RECOGNITION

A Python program captures input from a Mac or external microphone, automatically detects the language, and converts speech to text using the OpenAI Speech to Text API.

2 TEXT-TO-SPEECH

Speech API to synthesize the translation results at each step into the corresponding/approximate language for speech, ideally played back sequentially through 12 speakers.

3 LANGUAGE CLASSIFICATION

I researched all languages supported by the Google Cloud API, analyzed and classified languages into 12 linguistic regions, creating a classification table. Each interaction randomly selects a region, ensuring the uniqueness of each interaction.

4 TRANSLATION

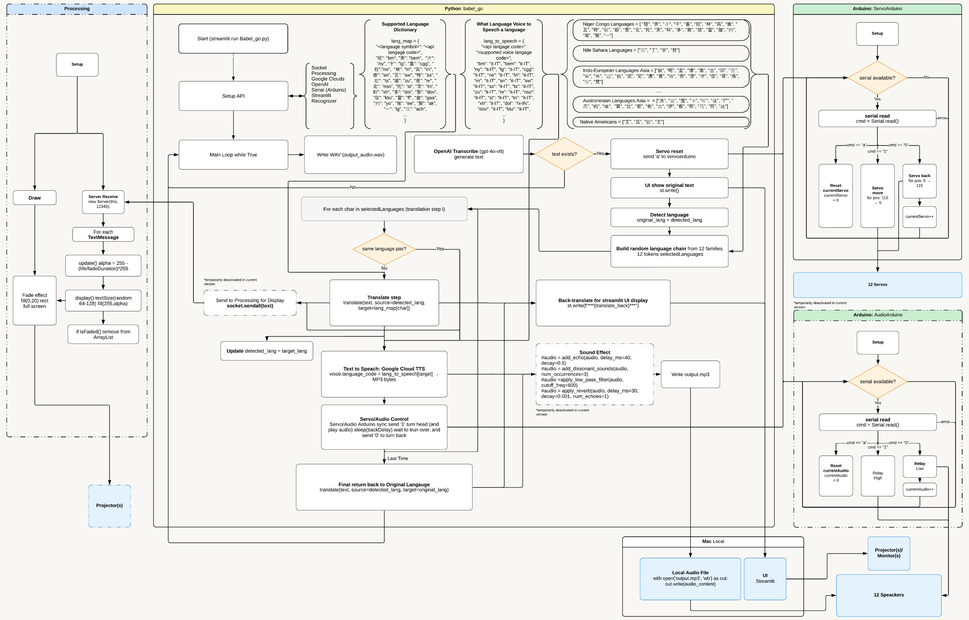
The Python program uses the Google Cloud Translate API to sequentially pass text through 12 language regions, each randomly selected language, with the output language becoming the input language for the next step.

5 ARDUINO + HARDWARE

ServoArduino controls 12 servos to synchronize head movements + AudioArduino controls the power switches of 12 speakers. Real-time data transfer between Python and the Arduinos achieved via pyserial.

6 FUTURE

a thermal printer will be added to print the translation trajectory onto a scroll of Rice paper, making the "loss" a tangible physical trace. The cause of distortion will be explained through the OpenAI API and printed as feedback to the audience.



The diagram right above shows the project workflow. Python functions as the main program, integrating translation APIs to process and generate the translations. Through serial output, the system sends data to Arduino and Processing to control the motors and the projected visuals. The final output is delivered through the speaker and projector.

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