

- Mission Statement:
  - To Expose language learners to Realistic Practice Environments through an immersive virtual cultural language experience.
- Research Questions/Problem:
  - The natural goal for learning a new language is connection and communication, but traditional language learning methods focus on the means to an end, and not the end goal itself. practicing a foreign language becomes tedious because intrinsic motivations are too abstract.
- Solutions:
  - MultiVerse
  - A VR world that immerses a user in realistic, culturally aware, scenarios that evoke nuanced and goal-oriented learning experiences
- Tasks:
  - Task 1 (easy): Find a conversation partner and free chat in the target language
  - Task 2 (moderate): Practice a real-world scenario in the target language in order to improve language skills
  - Task 3 (complex): Help another user learn your native language

## VR tasks:

- Goal - Chinese speakers learning English in an immersive environment; approach this in a research angle
- Target user - CEFR level A2 - B1;
- Potential testers -
  - Chinese Tourists on campus;
  - Local Chinese community
  - Chinese international students who are new to the country
- Game world ideas:
  - Model real-life situations; Doctor's office; Market; Mechanic; Buying tickets for transportations; Free Chat;
  - We also asked language learners and some of our previous participants about situations where they find difficult to navigate. It seems that they had trouble communicating in restaurants, over the phone, and situations where there involve technical terms.
  - Choose the mechanic situation based on the need findings
  - Next step:
    - To do: do more need-finding
      - Did you prepare for it
      - What did you do during the interaction
    - Pilot and test the script
    - Think about how to collect and analyze the data

## Research questions:

- Study 1:
  - Condition 1: user + tell them it's human
  - Condition 2: user + tell them it's AI
  - In both conditions, users are allowed to use any technologies, such as their phone or dictionary, they would normally use to help them communicate.
  - Compare 1&2: if the perception of the other person change how they interact with the system
- To see/test
  - **how much time they would engage with the dictionary/tech (i.e. language support)**
  - **How do they feel about engagement & anxiety**
  - Do they use different languages
  - **Attitude differences and changes - willingness to make mistakes**
  - If the learning experiences are different
  - Assuming we can build a good AI-powered conversational agent for foreign language interactions, how would this affect how learners interact with it? Is the interaction fundamentally different than interacting with another human?
  - **Some potential research questions that can be answered:**
    - Use of language support tools: Will users spend more time looking up words and using tools if they're not "wasting the time of their partner"?
    - Foreign language anxiety: Is it lower when interacting with an AI partner? Can practicing with an AI partner build confidence and lead to lower anxiety when speaking with future human partners (i.e., does the lowered anxiety transfer to human partners)?
    - Language choice: How does interacting with an AI partner affect language choice? Will users attempt to use more difficult language patterns that they have not yet mastered?
- Feedback question
  - How important VR is this experience?
  - Look at previous research and conclusions?
  - How do you collect data from your experiment to validate your assumptions and hypothesis
  - On what platform you want to run this and how to run this.
  - Solid idea what you're pursuing and how you envision this project timeline will align with the course timeline.
  - What's the learning objectives and resources appropriate the learners.
- Tech questions

- Deploy text-to-speech to unity
- We can preload a bunch of common phrases

## Task Flow:

- Approach
  - Show the user interface and
  - Use Google text to speech to give AI response
  - Test with AI & human
- 1. Onboarding
  - [show video] - static/just smoke
  - [Description in English & Chinese]:
  - Version 1:
    - your car caught on fire in the garage and the smoke set up the fire alarm. You noticed some problems with your car before but did not expect this to happen. The fire was put out and your car was sent to the mechanics. To help the mechanics figure out what went wrong, you need to describe what happened and what you've noticed before the incidence.
    - You wrote down a list of things that caught your attention on a piece of paper in Chinese. The mechanics only speaks English. Go to the mechanics and try your best to communicate with him!
    - Your Goal: your goal is to schedule an appointment to have your car fixed and figure out an alternative with the mechanic/autoshop, so you can go to work as usual.
  - Version 2 (help neighbor; the system can send Chinese notes to the participants to translate):
    - your neighbor's car caught on fire in the garage and the smoke set up the fire alarm in the building. Even he has lived in the US for years but he does not speak any English. You wanted to help him and drove him to the mechanics where the car was sent to.
    - 你邻居的车在车库里起火了，被拖送去了维修厂。虽然他在美国生活了很多年，你的邻居并不会说英语。你决定帮助他，载他去维修厂并替他跟机修工用英文沟通。
    - 为了方便你沟通，邻居在一张纸条上写了他所以记得可能跟这次事故有关的信息。
    - 你的目的是帮助你的邻居与维修工约定好修理费和维修时间，并咨询维修期间他能得到什么样交通替代以便上下班。
    - Your neighbor noticed some problems with his car before but did not expect this to happen. To help the mechanics figure out what went wrong, he wrote down a list of things he knows on a piece of paper in Chinese.
    - The mechanics only speak English. Go to the mechanics and try your best to communicate with him for your neighbor!

- When you're not sure about any word, you can ask "what is [the word you don't know]" and the system will translate for you.
- Your Goal: your goal is to help your neighbour schedule an appointment and figure out an alternative with the mechanic/autoshop so he can go to work as usual.
- [message to the participants] Description of an engine problem:
  - My fan would make loud noises while driving. it's been doing this for about a week. Usually, it does this for about a minute and then the check engine light turns on.
  - 一周前，我车子的风扇开始有奇怪的噪音。一般噪音出现一分钟左右，“检查引擎”的提示灯会出现。
  - [When accelerating, the overheating indicator would light up]
  - 踩油门时，引擎过热的等也会亮。
  - The car was sitting without a battery for a month and a half. I've put a battery in myself. Before that, the car would ran perfect.
  - 我车子之前没有电池放了两个月。我自己装的电池。在那都好好的。
  - I changed the water pump at 50,000 miles.... They say to change the thermostat when you change the water pump but I didn't do that. I had the dealers to take care of that but I'm not sure if they changed the thermostat.
  - 我在车50,000里程时候送去经销商那里保养，换了水泵。一般大家说换了水泵时候也要换恒温调节器。我经销商处理的保养，我不是很清楚他们换了没换恒温调节器。
  - Your car is insured. 我的车上了保险。
- [Example script 1]:
  - \*when participants reply Yes or No, ask "Can you tell me more about that" "Can you be more descriptive"
  - Actor: Hi there, how can I help you today? / + I am an AI Mechanic
  - P: [My car was on fire and was towed here. I need to repair it.]
  - Actor: I can definitely help you with that. Can you tell me more about the situation?
  - P: [give more details; e.g. I was at home and the fire alarm in the building went off; I went to the garage and saw my car on fire].
  - Actor: I'm glad you are okay. Was your car running at the time?
  - P: No I was inside the house.
  - Actor: Where did the fire start?
  - P: The engine. The front.
  - Actor: When was the last time you drove it?
  - P: [yesterday. I use it every morning]
  - Actor: Did you have any other problems before the fire?
    - Did you notice anything unusual before it broke down?

- P: [rattling noise from engine].
- Actor: Can you show me where the problem is?
  - Can you describe where the fire was on the vehicle?
- Actor: How long has it been like that
- P: [about a week]
- P: [give a respond].
- Actor: Left or right side?
- P: [give a respond].
- Actor: Have you noticed any strange noise or strange smell?
- Actor: Have you checked your indicators?
- Actor: Have you checked the water thermometer.
- Actor: Did your car give you any warning?
- Actor: I have to inspect your car to see which part is damaged. Let me take a look here.
- Actor: Hmmm, I see. It sounds like you had an engine fire due to overheating.
  - It seems that the [technical word] is broken ... it seems that the engine was overheated. When did you last change the oil?
- P: Overheating? Is it repairable/fixable/ can you fix it?[may or may not ask follow up questions]
- Actor: We cannot salvage the engine.
- P: What does it mean? Can you fix it?
- Actor: That means we can't fix it. You will need a new one.
- P: Does it mean I need a new car.
- Actor: No, just a new engine. It will cost \$2000 dollars, but we take insurance if you have it.
- P: 2000? Why it is so expensive.
- Actor: [impro...]
- P: I have insurance.
- Actor: With insurance, only \$400 deductible.
- P: What is deductible
- AI System: 在保险单中，免赔额是保单持有人支付任何费用之前由保单持有人自付的金额。在一般用法中，免赔额一词可用于描述保险公司用作保单支付门槛的几种类型的条款之一
- P: So that means I only pay \$400?
- Act: Yes
- P: That sounds good. Can I fix it here?
- Actor: Yes, we have appointments for Monday at 2:30, and Tuesday at 5 pm. Which is your preference?
- P: How long would it take?
- Actor: Our standard return period is 15 days
- P: So I won't have my car for 15 days? What should I do while my car is here
- Actor: Ah, we can give you a rental car for the meantime
- P: [pick a time]

- Thank you. If that's the case, I want to take the early appointment. Monday I think?
- Actor: Great. We have set your appointment, see you on Monday!

## Collect Data, Two-way communication:

- To collect data -
  - If the virtual meeting, use zoom or hangout to record the entire session.
  - Ask the participant to share their screen and do screen recording.
  - They don't see me, but only hear the speech
  - See
    - if they understand the synthesized speech
    - The need to react quickly
    - If they use tech to help

## Script Testing & Feedback:

### Testing

- We used both chatbot interface and direct role-plays to test our scripts and scenario we have in mind. The choice of the mechanic and autoshop was inspired by our needfinding, where one participant mentioned he had trouble communicating with a mechanic.

### Feedback

- The self-combustion seems improbable and the car is probably not going to be repairable.
- Outside judgments and emotions hindered the flow of the engagement - we asked participant to arrange for repair but participant refused to "pay" the mechanic for the repair.

Reference for the script:

<https://www.johnhughes.com.au/blog/common-car-troubles-their-causes-and-solutions/>;

<https://www.oklahomautoparts.com/list-car-problems-solutions/>

<https://www.autotrainingcentre.com/blog/auto-technicians-repair-fire-damaged-cars/>

<https://www.wikihow.com/Deal-with-a-Car-Fire>

# Archive

## Additional Literature Review

[AI-generated profiles? Airbnb users prefer a human touch](#)

### Potential Problems?

- **A coolant leak**
  - The levels gradually diminish. Nothing alarming until your vehicle dries up, makes a suspicious noise and you are forced to stop on the side of the road. Without its elixir, the car starts coughing while pumping what it can. Temperatures become abnormally high until the final failure.
- **A damaged breech gasket**
  - Same here, the car will eventually stop and opaque smoke will escape from the hood. The seal is no longer watertight and causes the coolant to leak. The first sign of failure is a loss of performance of the vehicle.
- **The water pump that makes the cooling fluid web**
  - The coolant can no longer circulate freely. The car's stopped, the engine's overheated.
- **The radiator fails**
  - If the radiator fan fails, the water is no longer cooled and begins to boil gently.
- **Warning**
  - An overheated car is dangerous. Moreover, High temperatures can cause the engine to break prematurely. Any sign of weakness, contact a professional.

### Potential videos:

- <https://www.youtube.com/watch?v=1tIWu40pYJM>
- <https://www.youtube.com/watch?v=Dko5vVSS4LQ>
- Engine overheating: [https://www.youtube.com/watch?v=7m\\_pZTeFkZw](https://www.youtube.com/watch?v=7m_pZTeFkZw)

### Unity Assets:

- Garage <https://assetstore.unity.com/packages/3d/environments/urban/garage-21042>
- Car with open hood  
<https://assetstore.unity.com/packages/3d/environments/urban/garage-21042?category=3d%2Fvehicles&q=car&orderBy=0&page=3>