

# Research in VIP Research Group

---

**Maiga Chang**

[maiga.chang@gmail.com](mailto:maiga.chang@gmail.com)

<https://maiga.athabascau.ca>

Discord: **.maiga**

Associate Dean of Research, Faculty of Science and Technology, Athabasca University, Canada

Full Professor, School of Computing and Information Systems, Athabasca University, Canada

Honorary Chair Professor, Multidisciplinary Academic Research Center, National Dong Hwa University, Taiwan (2023~2024)

IEEE Computer Society Distinguished Visitor on **AI** and **Chatbot** (2023~2025, <https://www.computer.org/profiles/maiga-chang>)

Distinguished Researcher Award 2022, Asia-Pacific Society for Computers in Education (APSCE)

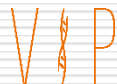
Vice President, International Association of Smart Learning Environments (<http://iasle.net>)

Chair (2021~) of Educational Activities Committee, IEEE Northern Canada Section

Editor-in-Chief of Educational Technology & Society (SSCI, Open Access)

Editor-in-Chief of International Journal on Distance Education Technology (EI, SCOPUS & ESCI, Open Access)

Editor-in-Chief of Bulletin of Technical Committee on Learning Technology (ESCI, Open Access)



# Required Skills

---

- Service
  - PHP or Python
    - Python accesses MySQL/MariaDB with python3-mysqldb.connector or mysqldb.connector-python
    - Python and PHP uses shared variables (i.e., configuration/parameters) via import a config.py and include a config.php
  - Running Python script that takes parameters from command line
  - PHP executes a Python script with exec
- Server Side
  - PHP
    - PHP uses MySQLi or PDO to access MySQL/MariaDB
    - PHP uses shared variables (i.e., configuration/parameters) via include a config.php
  - SQL statements
- Client Side
  - Browser app with CSS and JavaScript
  - Android app development in Kotlin or Java and uses WebView
- Communication
  - JSON as communication package format
  - AJAX with XMLHttpRequest (not using jQuery)
- Configuration and Setup
  - Terminal/Command mode in Ubuntu 20.04/22.04 or above
- Development
  - Git commands
  - SSH/Putty and SFTP/FileZilla with private key

# VIP Research Group's Youtube Channel

<https://youtube.com/@vipresearchgroup>

encourage everyone to subscribe it

The screenshot shows the YouTube channel page for VIP Research Group. The channel has 77 subscribers and a 'Subscribe' button. The main content area features two rows of video thumbnails. The first row, titled 'MEGA World', includes videos on using MEGA World v3.0 for students and teachers, a conversation quest, conversation tree and NPC management, and a multiplayer educational game. The second row, titled 'Ask4Summary', includes a research progress presentation and three stages of an automatic answering service, along with an installation guide for a Moodle plug-in. The left sidebar shows navigation options like Home, Shorts, Subscriptions, Library, History, Watch later, Liked videos, and various subscription categories.

VIP Research Group  
77 subscribers

Subscribe

HOME VIDEOS SHORTS LIVE PLAYLISTS CHANNELS ABOUT

MEGA World ▶ Play all

- How-To [Students] use MEGA World v3.0  
VIP Research Group  
66 views • 7 months ago
- How-To [Teacher] use MEGA World v3.0  
VIP Research Group  
14 views • 7 months ago
- Conversation quest  
VIP Research Group  
24 views • 4 years ago
- Conversation tree and NPC management  
VIP Research Group  
59 views • 4 years ago
- Multiplayer Educational Game for Assessment...  
VIP Research Group  
563 views • 9 years ago

Ask4Summary ▶ Play all

- Research Progress Presentation Automatic...  
1:00:51
- Stage 1 of Automatic Answering Service for...  
2:37
- Stage 2 of Automatic Answering Service for...  
3:29
- Stage 3 of Automatic Answering Service for...  
10:11
- Installation of Ask4Summary Moodle Plug-in  
2:25

# Research Streams

---

- ❑ Educational Game and Game-based Assessment Platform
- ❑ Text Summarization and Chatbot
  - AI (Natural Language Processing based)
  - AIML (Artificial Intelligence Markup Language)
  - RiveScript (Artificial Intelligence Scripting Language)
- ❑ Web and Mobile Application
  - Data Mining (Time-Series Behaviour Data Mining)
  - Generative AI

# Educational Game and Game-based Assessment Platform

---

- MEGA World
- Trading Card Game
- In-game Card as Educational Reward (ICER)

# MEGA World

---

MEGA World (Multiplayer Educational Game for All) is a web-based massively multiplayer educational game platform which supports any languages and is capable of access any existing external resources (e.g., multimedia, materials, online meetings, etc.). Teachers can create their virtual worlds as well as create learning and assessment activities (i.e., quests in the game) for students. Students can learn specific knowledge and reach the learning goal by taking and solving those quests while playing.

# MEGA World v3.0 (<https://megaworld.game-server.ca>)



# Trading Card Game (TCG) and In-game Card as Educational Reward (ICER)

---

Can we encourage students to do more for learning – via giving them in-game cards as educational rewards?

- Trading Card Game (TCG)
  - <https://tcg.game-server.ca/>
- In-game Card as Educational Reward (ICER)
  - <https://icerweb.gameresearch.ca/>
  - <https://maiga.athabascau.ca/#icer>



# Trading Card Game (In-game Card as Educational Reward)





## Griffin

4-star card

Element: Air  
 Category: Flying  
 Size: XL

(cost player 4 BL Pts as dies)

Health: 20

Attack: 13

Defense: 5

Range: 2



## Silver Dragon

5-star card

Element: Air  
 Category: Dragon  
 Size: XL

(cost player 4 BL Pts as dies)

Health: 30

Attack: 15

Defense: 7

Range: 2

## Learning

3-star trap card

stealing attacker's  
 50% attacking  
 power when under  
 opponent's attack



## Card Return!

1-star magic card  
 forcing opponent  
 to take back two  
 cards from  
 the battle field



# Text Summarization and Chatbot

---

- Ask4Summary
- Visualized Editing Environment (VEE) for building chatbots
- Speaking-based Conversation Quest
- and more, e.g.,
  - ChatbotLLM, Discordbot VIP-Bot, 5-Component Chatbot, etc.

# Summary Generation for User's Question

---

**Ask4Summary** reads materials uploaded by users so it can generate summary for user's questions asked online with their browser. Ask4Summary could be an online representative not only for online learning but is also capable of helping users on their questions regarding products, healthcare, etc. if there are correspondent text-based materials existing for Ask4Summary to read in advance.

# Ask4Summary v1.0

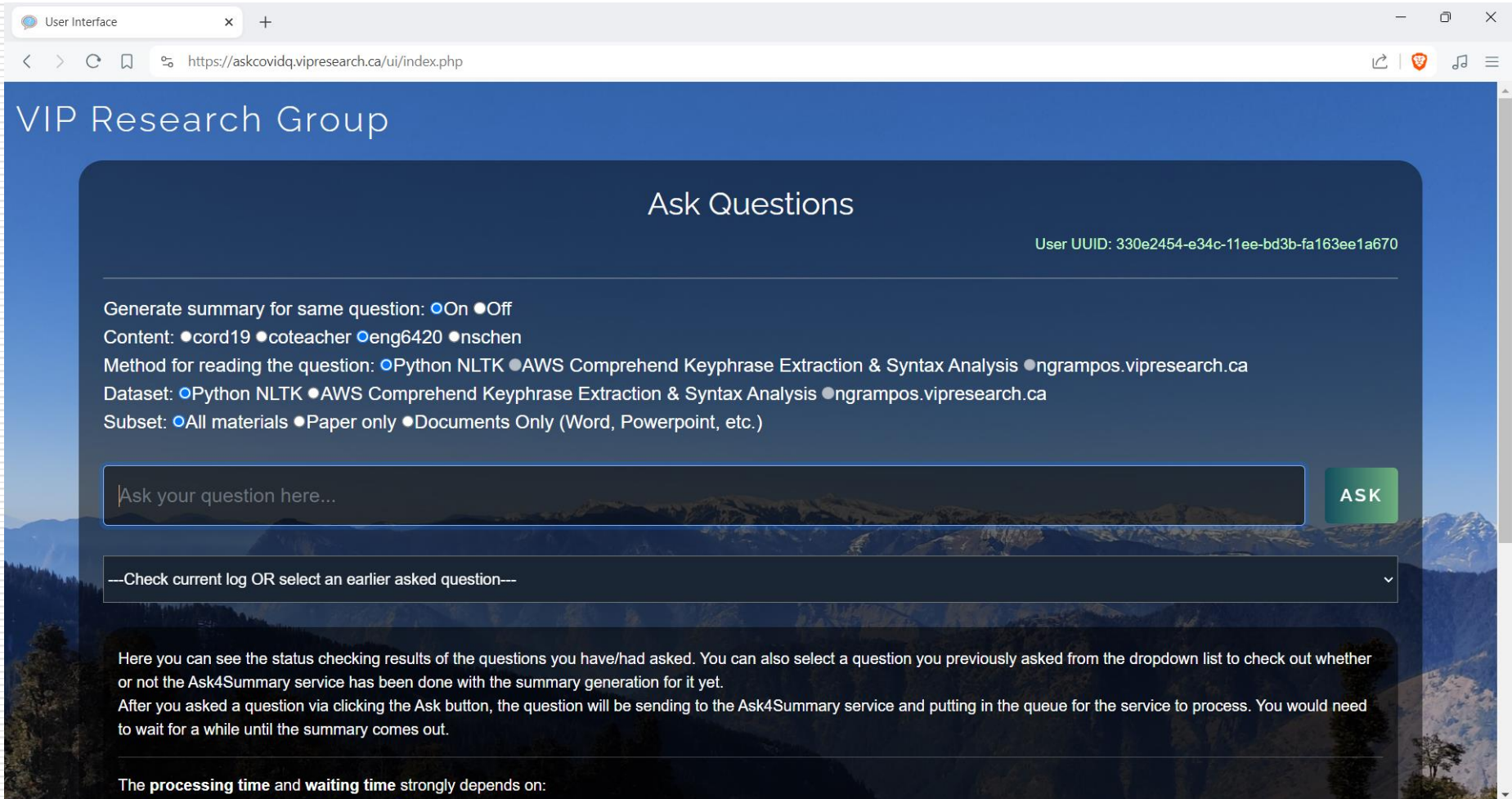
□ <https://ask4summary.vipresearch.ca>

The screenshot shows a web browser window displaying the homepage of the Ask4Summary service. The browser's address bar shows the URL `askcovidq.vipresearch.ca/index.php`. The page has a dark blue header with the text "VIP Research Group" on the left and a hamburger menu icon on the right. The main content area features a large white heading: "Automatic Answering Service for Coronavirus Question". Below this heading is a smaller line of text: "This research project is supported by Mitacs Globalink: "Automatic Answering Service for Coronavirus Question" under the supervision of Dr. Maiga Chang, Professor at the School of Computing and Information Systems, Athabasca University." At the bottom of the main content area, there are two prominent blue buttons: "DASHBOARD" and "TRY IT". The background of the page is a scenic landscape of snow-capped mountains under a clear blue sky.



# Ask4Summary v2.4

 <https://ask4summary.vipresearch.ca>



User Interface x +

https://askcovidq.vipresearch.ca/ui/index.php

## VIP Research Group

### Ask Questions

User UUID: 330e2454-e34c-11ee-bd3b-fa163ee1a670

Generate summary for same question:  On  Off

Content:  cord19  coteacher  eng6420  nschen

Method for reading the question:  Python NLTK  AWS Comprehend Keyphrase Extraction & Syntax Analysis  ngrampos.vipresearch.ca

Dataset:  Python NLTK  AWS Comprehend Keyphrase Extraction & Syntax Analysis  ngrampos.vipresearch.ca

Subset:  All materials  Paper only  Documents Only (Word, Powerpoint, etc.)

Ask your question here...

ASK

---Check current log OR select an earlier asked question---

Here you can see the status checking results of the questions you have/had asked. You can also select a question you previously asked from the dropdown list to check out whether or not the Ask4Summary service has been done with the summary generation for it yet.

After you asked a question via clicking the Ask button, the question will be sending to the Ask4Summary service and putting in the queue for the service to process. You would need to wait for a while until the summary comes out.

The **processing time** and **waiting time** strongly depends on:

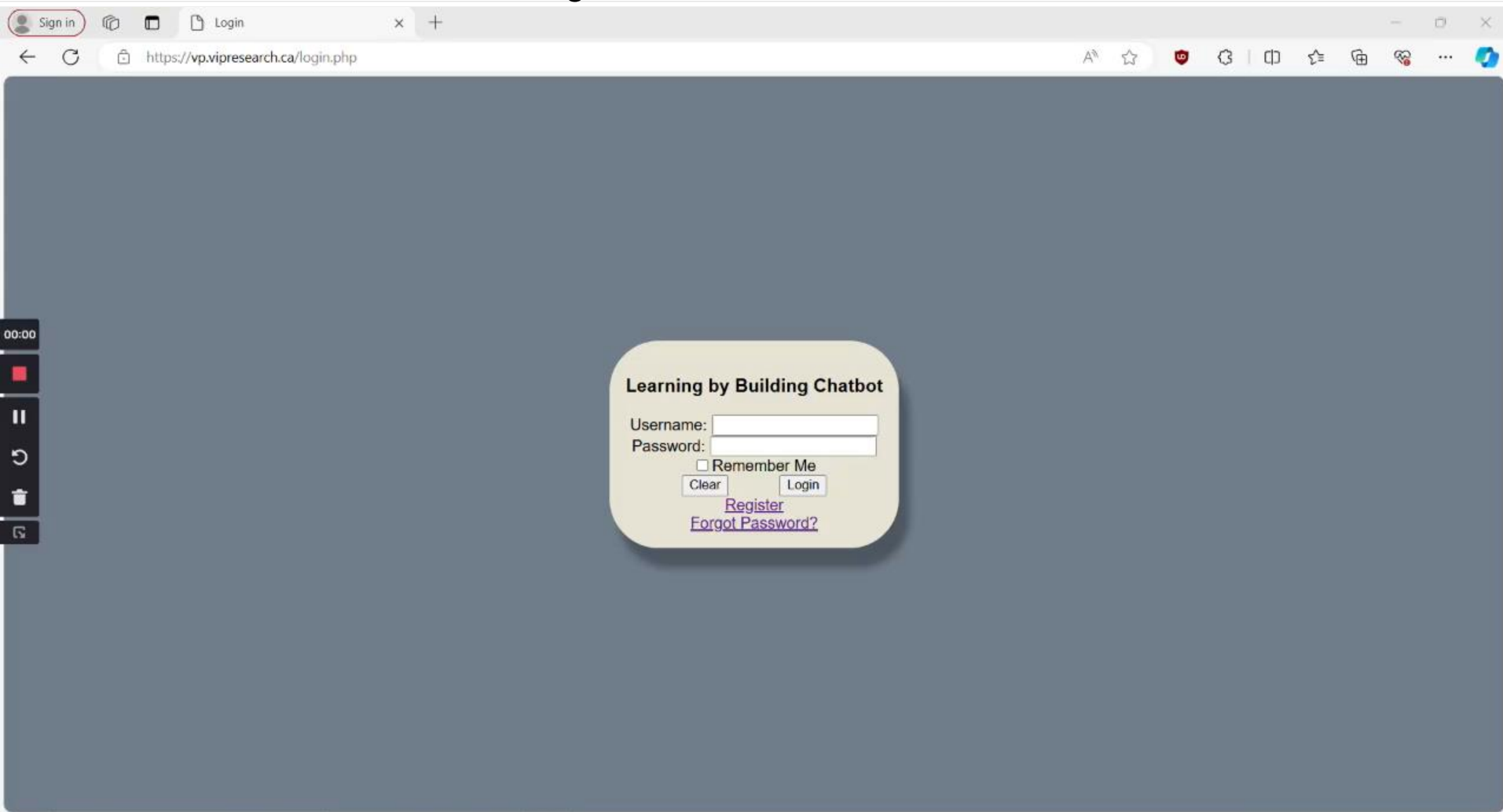
# Visualized Editing Environment of Building Chatbot for Learning and Training

---

This research project will build a visual editing environment for users (e.g., course/program creators, lecturers, and mentors) to create their own virtual patients/seniors through working independently, adopting, and altering existing virtual patients shared by others, or co-creation. All the created virtual patients/seniors will be transformed and stored in RiveScript form, but the users do not need to know anything about RiveScript while creating them in the visual editing environment.

# VEE – Creating Your Own Chatbot in Any Way

- ❑ <https://vp.vipresearch.ca/>
- ❑ Puzzle Piece Like Editing Environment





# VEE – Utilizing Different Chat Service Providers

- ❑ Ask4Summary (<https://ask4summary.vipresearch.ca>)
- ❑ ChatbotLLM (<https://chatbot.vipresearch.ca>)
- ❑ Open AI's GPT

The screenshot displays a web browser window at <https://vp.vipresearch.ca/manage.php>. The main interface is titled "Learning by Building Chatbot" and features a drag-and-drop editor. At the top, there are several colored blocks: "User Says:" (green), "Chatbot Response:" (blue), "Match Anything" (orange), "Weight:" (yellow), "Option:" (green), and "Here:" (purple). Below these, a central workspace contains a sequence of blocks: a "User Says:" block with the text "Hey", followed by a "Match Anything" block with "How are you?", then a "Chatbot Response:" block with "Hey" and a "Weight:" of 50, and finally another "Chatbot Response:" block with "Hey there" and a "Weight:" of 50. A "Save" button is located at the bottom right of the workspace. To the right of the workspace is a sidebar titled "supun's Chatbots" which lists several chatbot instances: "My Chatbot" (blue), "My Chatbot" (orange), "My Chatbot" (green), "My Chatbot" (blue), "Test Chatbot" (orange), and "Test Chatbot 1" (green). Each instance has a trash icon and a user icon. Below the list is a "Create Chatbot" button and a "Built-in Chatbots" section. At the bottom of the interface are "Friends" and "Logout" buttons. The browser's address bar and various icons are visible at the top of the window.

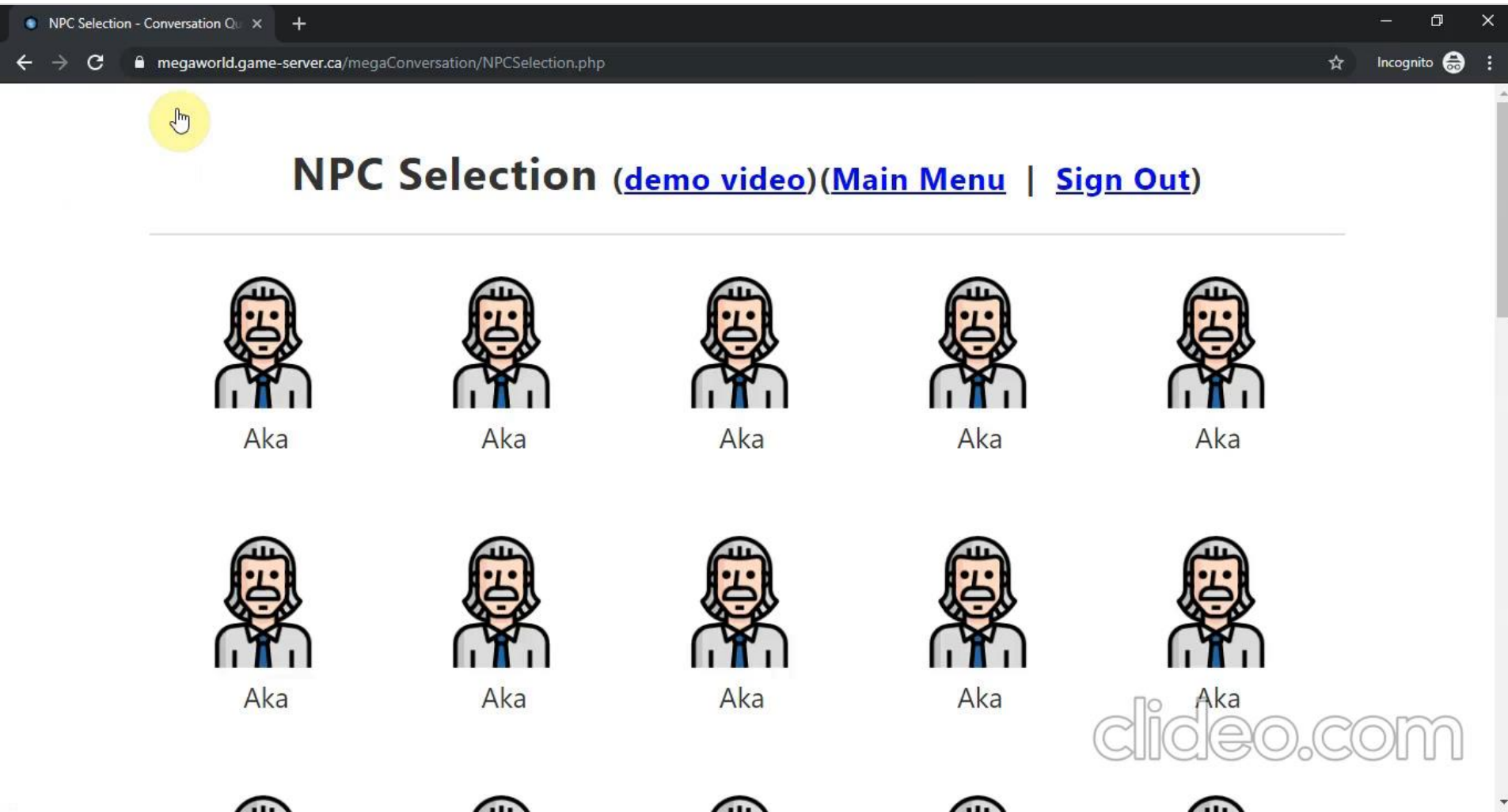
# Speaking-based Conversation Quest

---

Providing Students opportunities to practice speaking skill in a no-pressure environment where teachers can (co-)create conversations for various topics like Restaurant, Lodging, and Transportation and students can and need to “speak” to the NPCs (Non-Player Characters, or says computers) with appropriate responses.

# Student can practice with NPC

☐ <https://conversation.megaworld.game-server.ca>




# Student can practice with NPC (Spanish)

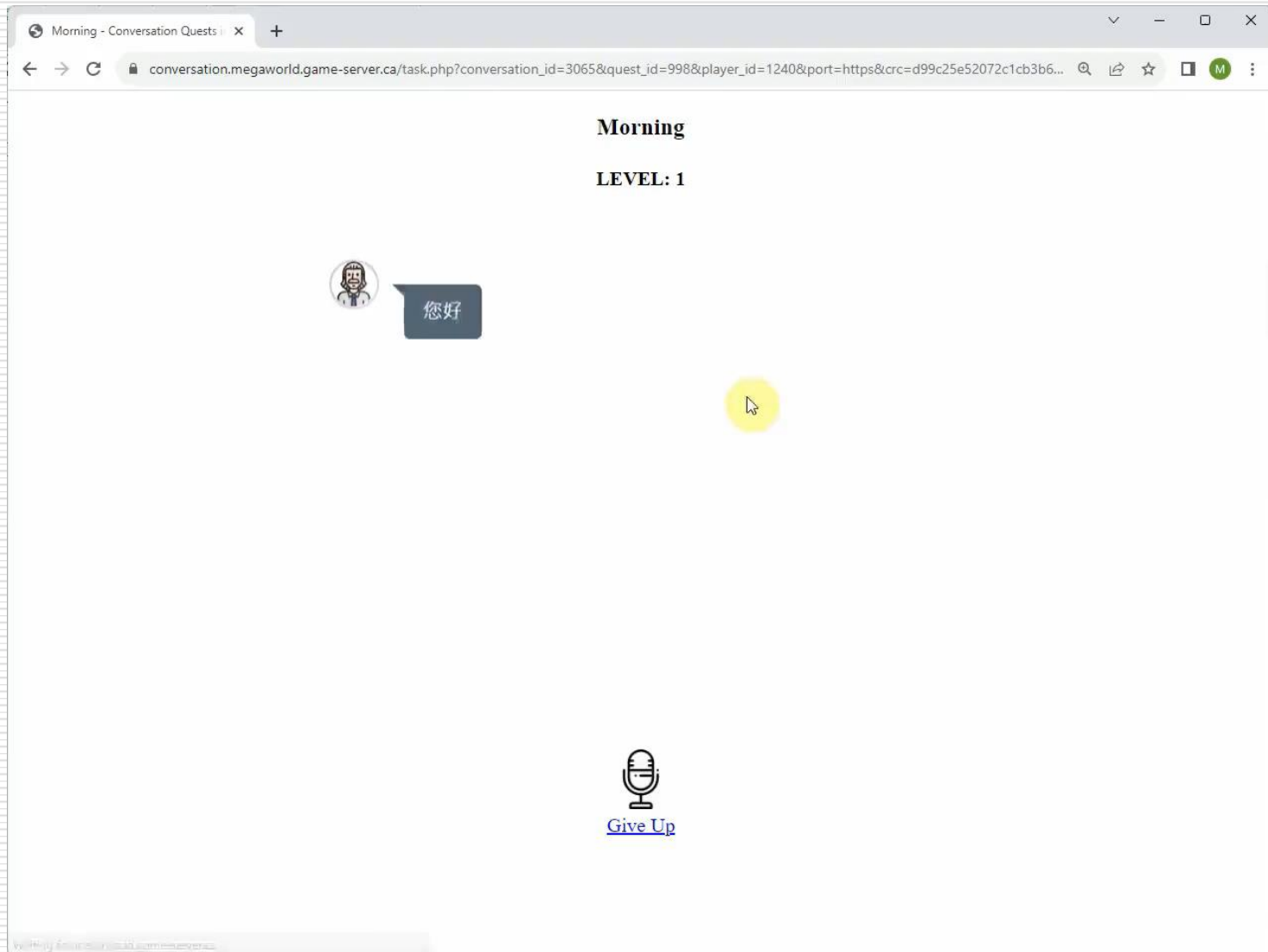
Dialog 2

LEVEL: 2

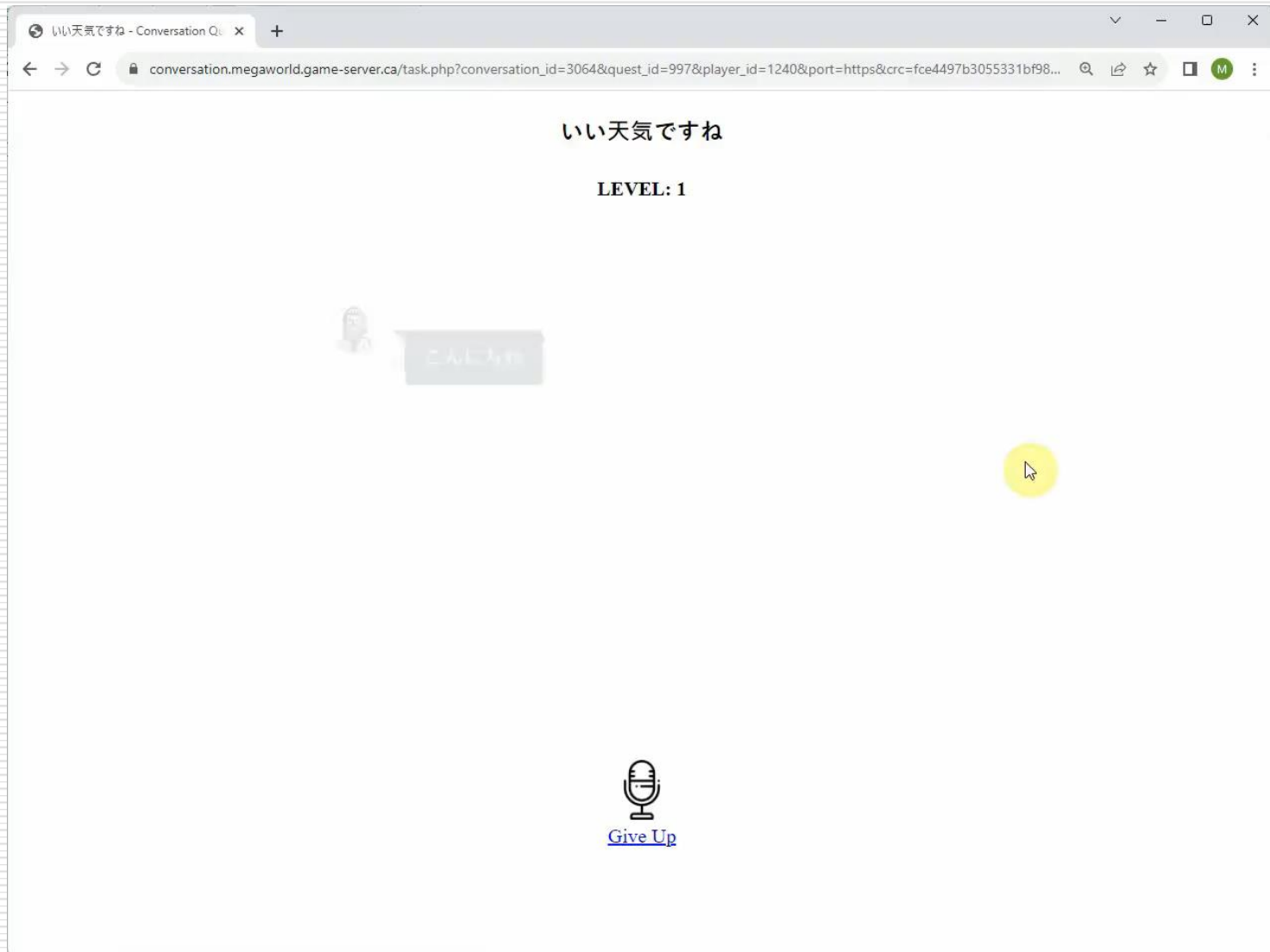
¿Puedo hacerte una pregunta?

  
[Give Up](#)

# Student can practice with NPC (Chinese)



# Student can practice with NPC (Japanese)



# Web and Mobile Application

---

- Authorship Forensics
- Next-Stop Recommender
- and more, e.g.,
  - Personalized Study Guide, Learning Object Relation Discovery (LORD), Behaviour Analytics, Note Takers, etc.

# Authorship Forensics

---

**Can we have a better way to train computer to differentiate AI-written text?**

Take advantages of

- Valid N-Gram and PoS Identifier v1.2
  - Statistical Natural Language Processing
- Convolutional Neural Network



 <https://ngrampos.vipresearch.ca>

Authorship Forensics Portal

https://ngrampos.vipresearch.ca/authorship\_forensics/

Add Model

Classes: Three ▾

Min Docs: 0

Max Docs: 0

Train %: 0.80

Auto %: 0.1

Threshold %: 0.995

View Predictions

https://ngrampos.vipresearch.ca/authorship\_forensics/view\_model.php?dataset=icce2024run3&modelFolder=model\_two\_0\_0\_0.8\_0.1\_0.995\_top5\_top15\_top50

```
importing tensorflow libraries: 2.781642436981201
importing custom libraries: 0.002301454544067383
various variable assignments and file creations: 0.0027098655700683594
getting authors_data based on the number of classes: 0.0027418136596679688
filtering authors_data by minimum number of docs: 1.9073486328125e-06
filtering authors_data by maximum number of docs: 2.384185791015625e-06
creating the unique authors list: 0.0001666545867919922
labeling the data and resizing the images: 58.84820365905762
assigning images to np arrays and converting author names to ints: 0.741199254989624
creating or loading the models: 0.3450171947479248
training the model_top_5 model: 2263.111414194107
training the model_top_15 model: 1201.8730993270874
training the model_top_50 model: 787.811089515686
Total time spent training all models: 4315.519589662552
```

# The proposed 3-stage Authorship Forensics approach

---

- A model trained
  - the 2-class (human and ChatGPT)
    - can be trained in 56.82 seconds
    - achieve precision 0.9682 ( $F_{0.5}$  score 0.95)
  - the 3-class (human, ChatGPT 3.5, and ChatGPT 4)
    - can be trained in 7 minutes and 26.076 seconds
    - achieve precision 0.9806 ( $F_{0.5}$  score 0.96)
- Low requirement on the size of the training data
  - trained with 60:40 training and testing data subset
    - the training subset contains around 381 texts
      - 343 texts for training and 38 texts for validation

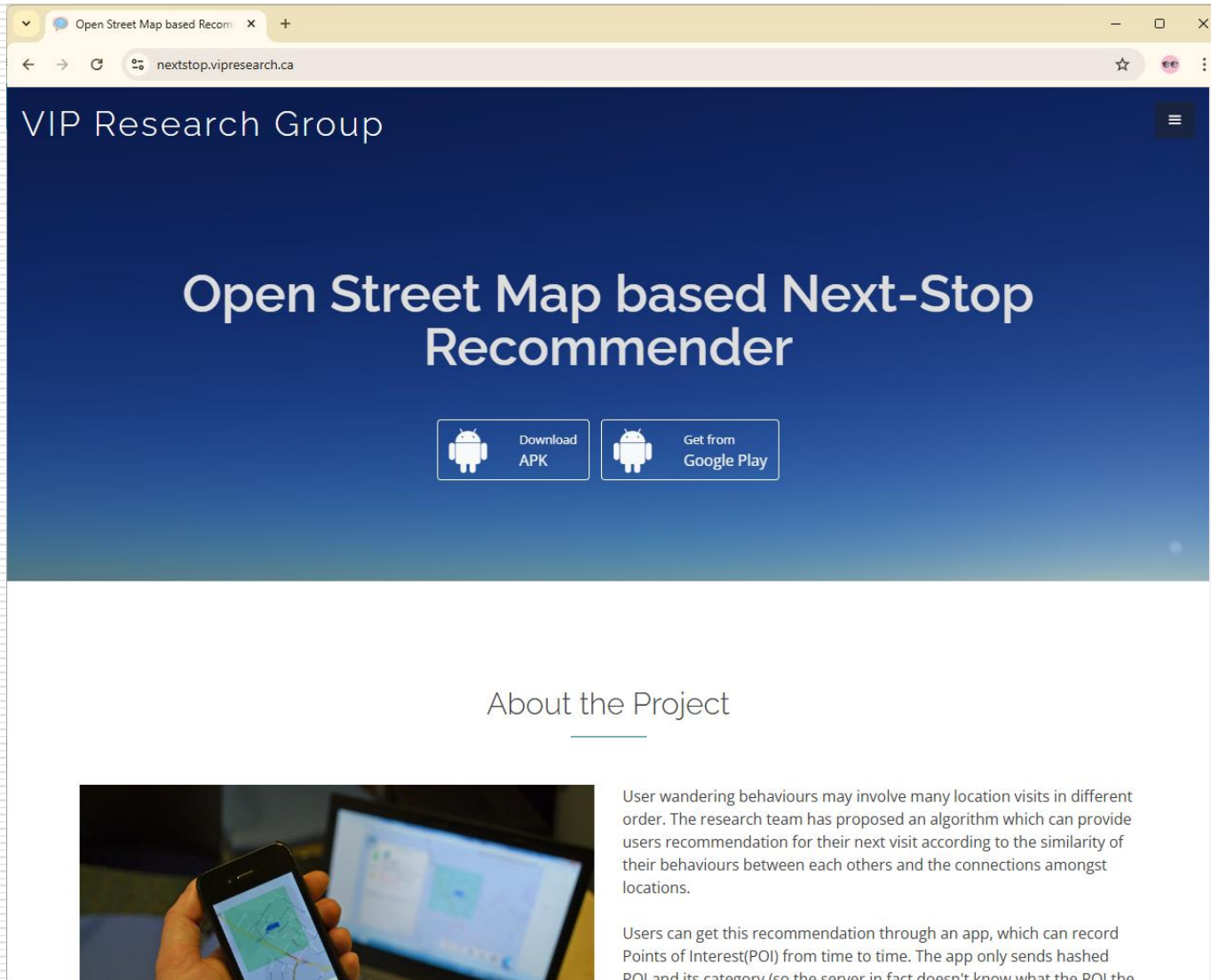
# Next-Stop Recommender

---

User wandering behaviours may involve many location visits in different order. The research team has proposed an algorithm which can provide users recommendation for their next visit according to the similarity of their behaviours between each others and the connections amongst locations.

# Next-Stop Recommender

□ <https://nextstop.vipresearch.ca>



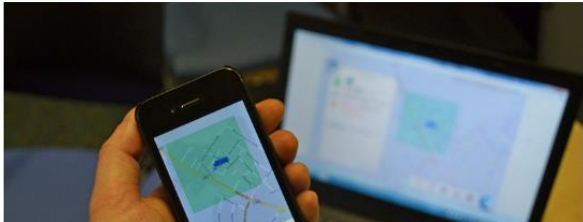
The screenshot shows a web browser window displaying the homepage of the Next-Stop Recommender project. The browser's address bar shows the URL `nextstop.vipresearch.ca`. The website has a dark blue header with the text "VIP Research Group" on the left and a hamburger menu icon on the right. The main content area features the title "Open Street Map based Next-Stop Recommender" in large white font. Below the title are two buttons: "Download APK" with an Android icon and "Get from Google Play" with an Android icon. The page is divided into sections, with the current section titled "About the Project" in the center. Below this title is a horizontal line. To the left of the text is an image of a hand holding a smartphone displaying a map, with a laptop screen visible in the background. To the right of the image is a paragraph of text describing the project's goal and methodology.

Open Street Map based Next-Stop Recommender

Download APK

Get from Google Play

## About the Project



User wandering behaviours may involve many location visits in different order. The research team has proposed an algorithm which can provide users recommendation for their next visit according to the similarity of their behaviours between each others and the connections amongst locations.

Users can get this recommendation through an app, which can record Points of Interest(POI) from time to time. The app only sends hashed POI and its category (so the server in fact doesn't know what the POI the

WeChat



LINE



**Thank you so much!**

**Maiga Chang**

[maiga.chang@gmail.com](mailto:maiga.chang@gmail.com)

<https://maiga.athabascau.ca>

Discord: .maiga



TCG



OMEGA