An Innovative and Immersive Chinese Language Pilot Summer Program for Cybersecurity College Students

Dr. Waleed Farag, Director, Indiana University of Pennsylvania's Institute for Cybersecurity

2025 CAE in Cybersecurity Symposium - Charleston, SC – April 2025

IUP

IUP CHINESE LANGUAGE IMMERSION PROGRAM
FOR CYBERSECURITY STUDENTS

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University and PI Backgrounds

Indiana University of Pennsylvania

- One of four public research universities and part of the PA State System of Higher Education (PASSHE).
- One of the first schools to be designated by the NSA as a National Center of Academic Excellence.
- IUP Institute for Cybersecurity (ICS) is the entity responsible for coordinating all cybersecurity education and research activities.

Dr. Waleed Farag

- Professor of Computer Science at IUP and director of the ICS since 2012, securing millions of dollars in federal funds to support research and the work of the ICS.
- Founder and current PI of several major initiatives that contribute to the enhancement of cybersecurity research and education across the region.

Rank the most spoken languages in the world.

Standard Arabic

English

French

Hindi

Mandarin

Spanish

Program Overview and Learning Outcomes

Program Overview

- The IUP Chinese Language Immersion Program is a pilot program for cybersecurity students to expand their Chinese language skills. **IUP is the only university in the nation to offer a program of this kind.**

- The 10-week program was offered June 3, 2024 through August 9, 2024.

Learning Outcomes

- Recognize and write down each syllable in Pinyin of any Chinese words, phrases, and sentences.

- Understand the forms and meaning of conversations and narratives that match entry level on topics regarding greeting, scheduling, dining, shopping, and traveling; and (2) the pragmatics and associated cultural points behind.

- Recognize and understand high-frequency cybersecurity words, phrases, and simple sentences in Chinese.

- Pronounce each syllable in the Pinyin chart with four tones and to read aloud words, phrases, and sentences correctly.

- Communicate on daily topics and apply high-frequency words and expressions in cybersecurity.

- Read and understand Chinese text with assistance of online tools and/or apps.

- Type Hanzi on electronic devices (including finger writing on touchscreen devices) any Chinese text seen.

- Write sentences and paragraphs on use of vocabulary in a comprehensible and appropriate manner for real world tasks.

- Use resources and tools in Chinese learning and discuss learning strategies including reflecting on their own experience.

- Discuss understanding of Chinese culture in comparison and contrast with American culture.

Program Objectives

Develop Cybersecurity Professionals with Listening and Writing Proficiency In Chinese

Recruit Motivated Cybersecurity College Students
- Program Marketing
- Application Development/Collection
- Application Evaluation

Offer Immersive Hybrid 10-week Summer Program
- Hiring of Instructors
- Curriculum/Schedule Development
- Creation of Program Handbook
- Residential Program Logistics

Conduct Post-Program Evaluation and Follow-Up Activities
- Submission of Reports
- Feedback Collection/Analysis
- Monthly Follow-Up Activities

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Marketing and Application Development

Marketing

Marketing of the program began in September 2023 with the creation of the project website, a poster presentation at the 2023 NCEC in Chicago, design of a flyer, brochure, posts on social media, and a targeted email campaign.

Application Criteria

Applications were accepted through December 2023 and students were required to submit the following:

- Academic Information
- Previous Chinese language experience/course work
- 500-word personal essay
- Two professor recommendations
- Self-evaluation of Chinese proficiency

INDIANA UNIVERSITY OF PENNSYLVANIA & NATIONAL CENTERS OF ACADEMIC EXCELLENCE IN CYBERSECURITY PROUDLY PRESENT:

CHINESE LANGUAGE IMMERSION PROGRAM FOR CYBERSECURITY STUDENTS

SUMMER PROGRAM: JUN 3 - AUG 9, 2024 & ONLINE FOLLOW UP ACTIVITIES THROUGHOUT AY 2024-25

PROGRAM THEMES
- Pinyin, greetings and introductions.
- Time, dining, traveling and scheduling.
- Usefulness of Chinese in cybersecurity.

PROGRAM FORMAT
- ONLINE Weeks 1-2 & AY 2024-25
- INDIANA, PA Weeks 3-5 & 8-10
- LINTHICUM, MD Weeks 6-7

APPLICATIONS NOW OPEN!
Visit the program website below or email questions to chinese-immersion-program@iup.edu
www.iup.edu/chinese-immersion-program

PARTICIPATION ADVANTAGES
- **Free** including travel, lodging, meals and events.
- Stipend of **$6,000** for completion of program and follow up activities.
- Practice speaking/writing Chinese in the **real world**.

PROGRAM INFORMATION
- Targets college sophomore and junior students (AY 23-24) majoring in Cybersecurity or related fields.
- Preference given to applicants with prior knowledge of the Chinese language.
- Applicants must be US citizens or permanent residents.

IUP Chinese Language Program Flyer

IUP CHINESE LANGUAGE IMMERSION PROGRAM FOR CYBERSECURITY STUDENTS

Participant Selection

- **80** applications were received.

- A database was created, and all applications were evaluated by the Program Team.

- Applications were scored based on the following scale:
  - Academic Performance (**45%**)
  - Recommendations (**30%**)
  - Personal Essay (**15%**)
  - Language Proficiency (**10%**)

- The **15** students with the highest scores were chosen to participate in the program and split into two groups based on Chinese language proficiency and experience.

Application Evaluation Database

Application Statistics

APPLICANTS VS. ACCEPTED PARTICIPANTS

	Applicants	States	Schools
Applied	80	28	49
Accepted	15	12	15

	Male	Female	Other
Applied	52	27	1
Accepted	9	6	0

- Applied
- Accepted
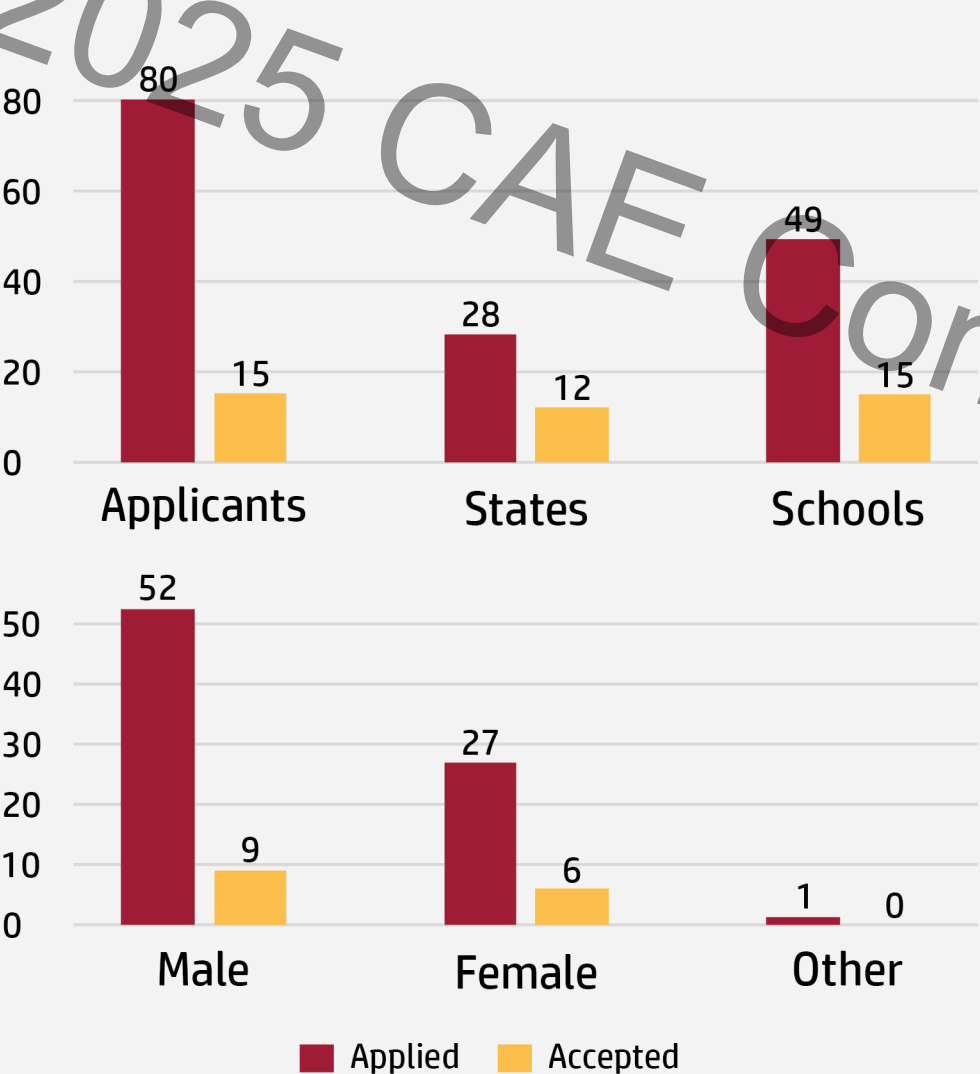
CHINESE PROFICIENCIES OF ALL APPLICANTS

	None	Beginner	Intermediate	Advanced
Speaking	22	39	16	3
Listening	21	35	19	5
Writing	31	33	16	
Reading	27	35	16	2

- None
- Beginner
- Intermediate
- Advanced
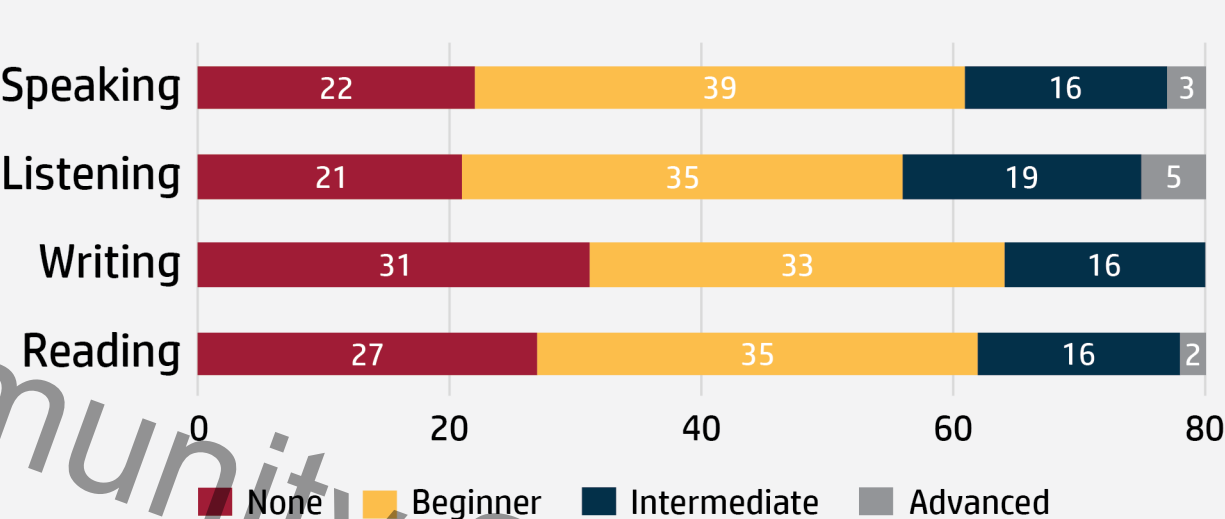
CHINESE COURSES TAKEN BY APPLICANTS

	0	1	2	3	4+
College	48	20	3	2	7
High School	60	8	5	2	5

- 0
- 1
- 2
- 3
- 4+
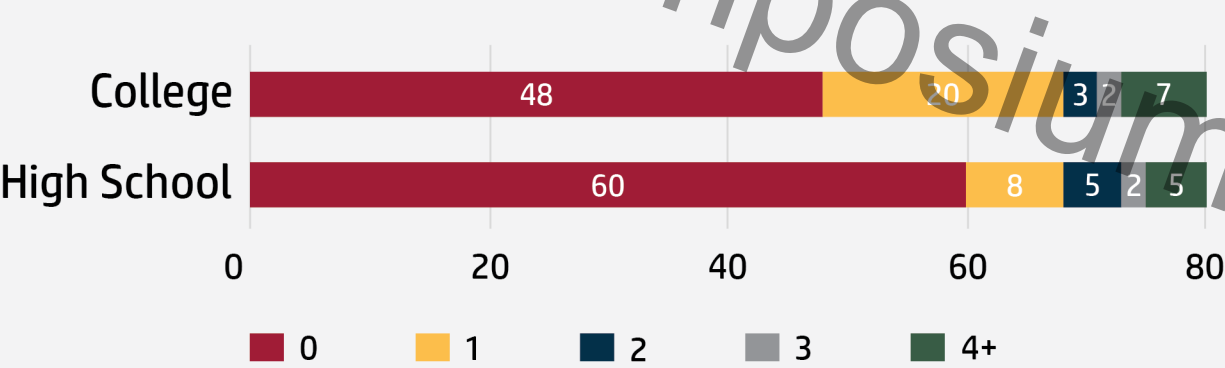
Instruction Team

Dr. Waleed Farag
Program Director
Indiana University of PA

Xiwen Lu
Program Instructor
Brandeis University

Linus Morales
Program Lead Assistant
Stone Independent School

Dr. Shijuan Liu
Lead Instructor
Indiana University of PA

Xiaoling Shi
Program Instructor
Cambridge School of Weston

Kenneth Au
Program Assistant
Kutztown University
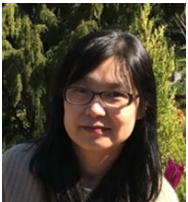
Tianshu He
Program Instructor
Duke University
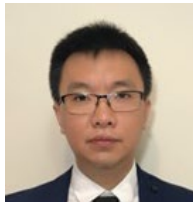
Ye Tian
Program Instructor
University of Pennsylvania

Wilson Hong
Program Assistant
Lafayette College

Lung-Hua Hu
Program Instructor
Brown University

Tianxue Yao
Program Instructor
Carnegie Mellon University

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FOR CYBERSECURITY STUDENTS

Curriculum and Program Structure

WEEK 1: 6/3/24 to 6/9/24

Location: Virtual

Topics: The four tones, Pinyin initials, self-introduction, career goals, hobbies.

Assignments: Tone excerises, self-introductions, reflection paper.

WEEK 2: 6/10/24 to 6/16/24

Location: Virtual

Topics: Appearance, family, introducing others, personality, relationships.

Assignments: Presentation video, reflection paper.

WEEK 3: 6/17/24 to 6/23/24

Location: IUP Main Campus - Indiana, PA

Topics: Time, schedules, food, educational activities, health, appointments.

Assignments: Routine project, reflection paper.

Events: Dining at local Chinese restaurant.

WEEK 4: 6/24/24 to 6/30/24

Location: IUP Main Campus - Indiana, PA

Topics: Dining, shopping, food.

Assignments: Dining and shopping skit.

Events: Dragon Boat racing.

WEEK 5: 7/1/24 to 7/7/24

Location: IUP Main Campus - Indiana, PA

Topics: Traveling in the US and abroad.

Assignments: Digital travel project.

Events: Chinese cooking class, Pittsburgh Chinatown field trip.

WEEK 6-7: 7/8/24 to 7/21/24

Locations: Washington, DC; Philadelphia, PA; Linthicum, MD.

Topics: Chinese culture, langauge practice.

Assignments: Field trip reflection paper.

Events: Waist drum dancing demonstration.

WEEK 8: 7/22/24 to 7/28/24

Location: IUP Main Campus - Indiana, PA

Topics: Cybersecurity vocabulary

Assignments: Language quiz, cybersecurity reflection paper, photo presentation.

Events: Guest Speaker Jesse Chiu

WEEK 9: 7/29/24 to 8/4/24

Location: IUP Main Campus - Indiana, PA

Topics: Cybersecurity case-study.

Assignments: Progress report on Capstone project.

Events: Guest Speaker Scott McGinnis

WEEK 10: 8/5/24 to 8/9/24

Location: IUP Main Campus - Indiana, PA

Topics: Individual and group capstone projects.

Assignments: Capstone project presentation.

Events: Kung Fu demonstration, End of Program Ceremony

Weekly Schedule Sample

IUP Chinese Language Immersion Program Schedule - Week 3: June 17 – 21, 2024
Beginner Group Schedule

Time	Monday June 17, 2024	Tuesday June 18, 2024	Wednesday June 19, 2024	Thursday June 20, 2024	Friday June 21, 2024
9:00am - 9:50am	Session 1 (combined) Welcome: Waleed Farag - LNRD 116	Session 1 Instructor: Tianshu He - LNRD 116	Session 1 Instructor: Tianshu He - LNRD 116	Session 1 Instructor: Tianshu He - LNRD 116	Session 1 Instructor: Tianshu He - LNRD 116
9:50am - 10:00am	Break	Break	Break	Break	Break
10:00am - 10:50am	Session 2 (combined) Instructor: Shijuan Liu - LNRD 116	Session 2 Instructor: Tianshu He - LNRD 116	Session 2 Instructor: He & Liu - LNRD 116	Session 2 Instructor: Tianshu He - LNRD 116	Session 2 Instructor: Tianshu He - LNRD 116
10:50am - 11:00am	Break	Break	Break	Break	Break
11:00am - 11:50am	Session 3 Instructor: Tianshu He - LNRD 116	Session 3 Instructor: He & Morales - LNRD 116	Session 3 Instructor: Tianshu He - LNRD 116	Session 3 Instructor: Tianshu He - LNRD 116	Session 3 Instructor: Tianshu He - LNRD 116
11:50am-1:30pm	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
1:30pm - 2:20pm	Session 4 Instructor: Linus Morales - LNRD 116	Session 4 Instructor: Linus Morales - LNRD 116	Session 4 Instructor: Linus Morales - LNRD 116	Session 4 Instructor: Morales & Liu - LNRD 116	Session 4 Instructor: Linus Morales - LNRD 116
2:20pm - 2:30pm	Break	Break	Break	Break	Break
2:30pm - 3:30pm	Session 5 (One-on-One) He: LNRD 116 I Morales: LNRD 103	Session 5 (One-on-One) He: LNRD 116 I Morales: LNRD 103	Session 5 (One-on-One) He: LNRD 116 I Morales: LNRD 103	Session 5 (One-on-One) He: LNRD 116 I Morales: LNRD 103	Session 5 (One-on-One) He: LNRD 116 I Morales: LNRD 103
3:30pm - 3:40pm	Break	Break	Break	Break	Break
3:40pm - 4:30pm	Session 6 (culture-Calligraphy) Instructor: Tianxue Yao - LNRD 104	Session 6 (Culture-holidays) Instructor: Liu & Morales - LNRD 104	Session 6 (culture-Calligraphy) Instructor: Tianxue Yao - LNRD 104	Session 6 (Culture-food) Instructor: Liu & Morales - LNRD 104	Summary & Presentations Instructor: Shijuan Liu - LNRD 104
4:30pm - 6:00pm	Dinner Break	Dinner Break	Dinner Break	Dinner Break	
7:00-8:30pm	Tutoring/Cultural (optional) PUTT G43: Linus, Wilson, Ken	Tutoring/Cultural (optional) PUTT G43: Linus, Wilson, Ken	Tutoring/Cultural (optional) PUTT G43: Linus, Wilson, Ken	Tutoring/Cultural (optional) PUTT G43: Linus, Wilson, Ken	6PM dinner in a local Chinese restaurant
Daily Topics	Time	School Life	Schedules	Plans/Food	Project Presentations
Weekend Activities	Familiar with Indiana and IUP (led by Linus Morales).				

Program Learning Management System

- A program course was created through IUP's learning management system D2L.

- The D2L course contains all content, assignments, discussions, logistics, and resources.

- Participants will have access to the course through the remainder of AY 2024-25.

Resources page from program D2L Course.
Sample daily module from D2L course.

Project Samples

Self Introduction

- **Assignment Summary:** Introduce yourself to your classmates and say your name, nationality, home state, profession, and age.

- Participant Submission Sample

Describing Others

- **Assignment Summary:** Introduce someone you know and comment on their appearance, character, personality, hobbies and include a personal anecdote.

- Participant Submission Sample

Schedules

- **Assignment Summary:** Create a slideshow on daily schedules and present it to the class. Images are from participant presentations.

Xīngqīèr hé Xīngqīsì
星期二 和 星期四

Wǒ xīngqīèr hé xīngqīsì děi qù shāngke.
我星期二和总起四嘚去上课。
Zǎoshàng 11 diǎn dào 12 diǎn yī.ke zuò zhùjiào.
早上 11点 到 12点一棵做助教。

Sample slide from a participant's Schedule Presentation

Project Samples

Skit Scripts

- **Assignment Summary:** Write a script for a skit using covered vocabulary.

Chinese Culture

- **Assignment Summary:** Create a slideshow on Chinese culture or history and present it to the class. This adjacent image is a sample slide from a student presentation.

Project Samples

Cybersecurity Topic Video

- **Assignment Summary:** Create a video on a topic related to Cybersecurity and/or safe online practices. Videos should be 3-5 minutes in length, use at least 10 vocabulary words, and incorporate three sentence patterns and idioms.

- [Participant (from the beginner group) Submission Sample](#)

Capstone Project

- **Assignment Summary:** Create a video documenting and reflecting on program experience to showcase learning and proficiency. Students should speak at minimum 50 sentences, include at least 10 pictures, and add subtitles in English and Chinese.

- [Participant Submission Sample](#)

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Cultural Immersive Activities

- Students participated in over 10 cultural activities throughout the program:
  - Waist Drum Dancing demonstration
  - Traditional Chinese cooking classes
  - Dragon boat paddling
  - Kung Fu demonstration
  - Dining at Chinese restaurants
  - Trips to Chinese museums

LEFT: Dragon boat paddling in Pittsburgh, PA. TOP RIGHT: Kung Fu Demonstration. BOTTOM RIGHT: Waist Drum Dancing demonstration.

Cultural Immersive Activities

TOP LEFT: Dragon dance demonstration. BOTTOM LEFT: Chinese cooking class. RIGHT: Chinese art museum visit, Washington D.C.

Field Trips to DC, Philadelphia, and NSA.

- From July 10 – July 16, 2024, participants traveled to Washington DC, and Philadelphia, PA for an immersive field trip focus on Chinese culture.

- Participants also visited the NSA on July 17-18, 2024 in Linthicum, MD.

- The following was provided to participants during their NSA visit:

  - Cryptology Museum Tour

  - Presentations on employment opportunities and linguistics.

  - Opportunities to learn specifics on career paths and daily work of NSA staff.

Program participants and staff during the NSA Site Visit on July 17-18, 2024

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Program Feedback

WEEK 4 SURVEY

PARTICIPANT RESPONSES OF SATISFIED OR VERY SATISFIED

- **99%** Accommodations
- **89%** Overall Structure
- **89%** Program Content

> "I have really enjoyed getting to know the teachers and the participants! I also find that I'm **learning useful vocabulary** every day and solidifying previously learned grammar. Additionally, I have really enjoyed **the cultural activities**, such as calligraphy and playing mahjong."

WEEK 10 SURVEY

PROGRAM IMPACT

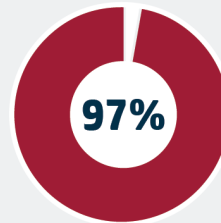- **93%** ranked the overall program as average or above.
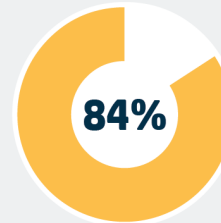- **100%** agreed that the program improved their Chinese skills.
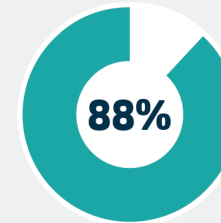- **87%** agreed the content added to their language comprehension.

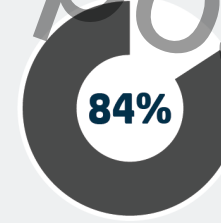### INSTRUCTOR EVALUATIONS (GOOD OR EXCELLENT)

- **97%** Knowledge
- **84%** Teaching Style
- **88%** Preparation
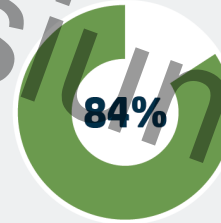- **84%** Feedback
- **84%** Approachability

Program Changes/Challenges

Changes

- ***Two Participant Groups:*** After review of applications, it was determined that splitting the highest scoring candidates into two groups based on self-reported skill level would provide a more beneficial program to all. Additional instructors were hired to provide instruction to both groups, and skill levels were also evaluated at the start of the program.

Challenges

- **Limited Amenities**: Due to campus construction projects and cost-reducing measures over summer, only one dining hall was open and fitness/health centers had limited hours. Participants would have made use of campus facilities if more were available.

- ***First Residential Offering:*** This was the first residential program of this scale offered by program leadership. We had to navigate challenges coordinating with many departments across campus and beyond.

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Lessons Learned and Future Improvements

Application Process

- Recommendation letters need to be sent directly to program staff.

- Applicants should be selected and notified as early as possible to facilitate:

  - Securing the approval to create university exception accounts.

  - Communicating with accepted students using their official university email accounts.

  - Issuing university ID cards as early as possible.

Program Improvements

- Clear deadlines for assignments/projects will be added to the online course to avoid confusion and ensure consistency.

- Tutoring sessions will be required for participants who earn less than satisfactory on assignments.

- Participants will be required to enroll in direct deposit to avoid payment delays.

- Striking a balance between the immersive and learning activities.

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Academic Year 2024-25 Activities

Activities are being offered throughout AY 2024-25 to expand on content delivered during the Summer 2024 program. These activities include the following:

Synchronous Monthly Meetings

- Three hours of synchronous meetings are held each month of the fall 2024 and spring 2025 semesters for a total of 24 hours.

- Participants are required to attend a minimum of six synchronous meetings to receive the remainder of their participation stipend.
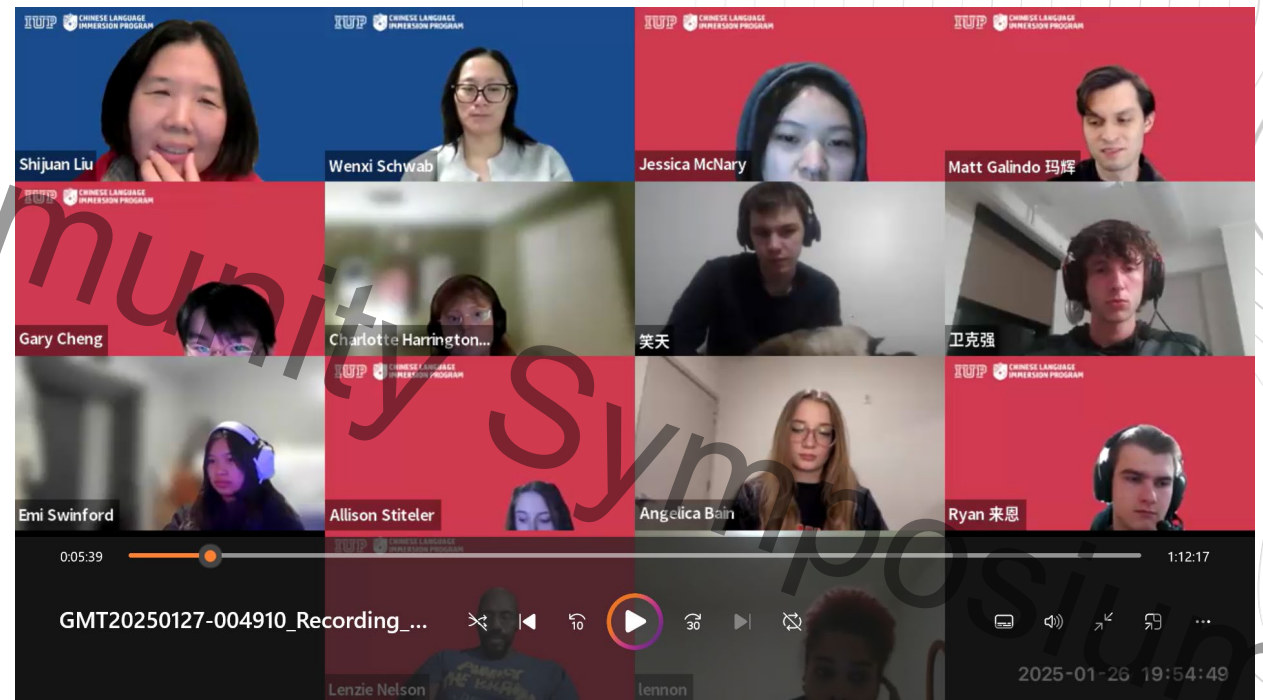
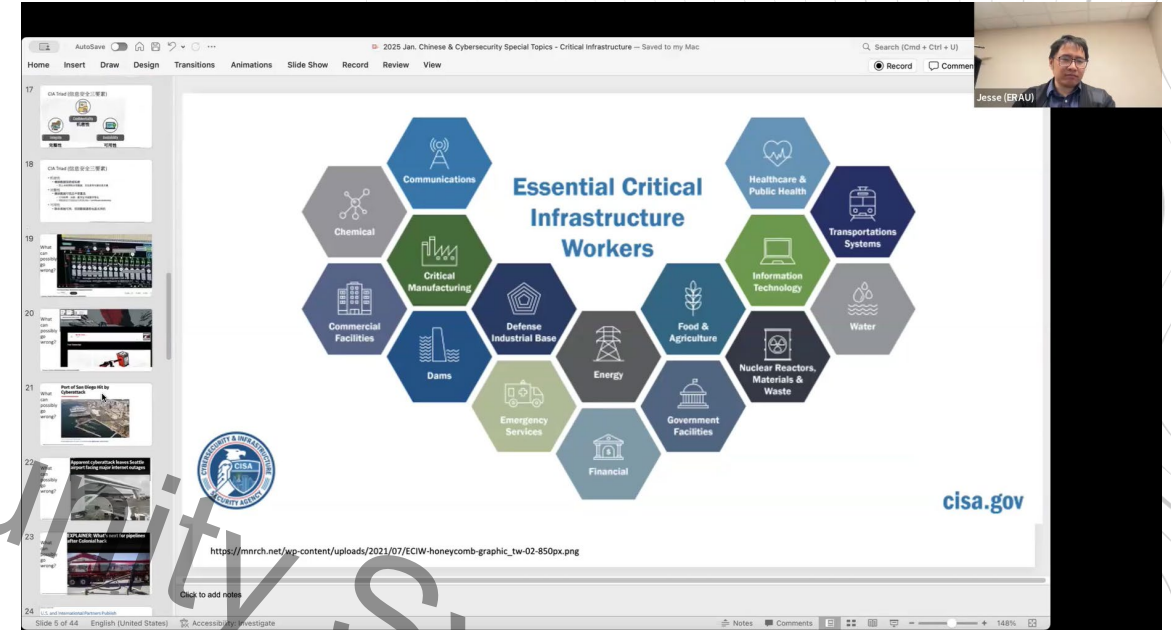*Screenshot of virtual monthly meeting session.*

Academic Year 2024-25 Activities

Guest Speakers

- **Dr. Xinwen Wu** gave a presentation titled *"Exploring Web Attacks."*

- **Mr. Jesse Chiu** gave a presentation titled *"Chinese & Cybersecurity Special Topics: Critical Infrastructure."*

- **NSA Representatives** gave a presentation on Steganography and Cybersecurity Concepts in Chinese

Screenshot from Jesse Chiu's guest speaker presentation.

One-on-One Tutoring

- Professional tutors were hired and have provided **over 45 sessions** to participants since late fall 2024.

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Conclusion/Questions

Program Highlights

- The only program of its kind offered nationally.
- Recruited a highly qualified instruction team and 15 very promising college students from 15 universities representing 12 states.
- **80** applications received and evaluated.
- **11** instructors and assistants identified and hired.
- **40%** of selected participants are female.
- The student-to-teacher ratio was **1.5 to 1.**
- Over **200** hours of language instruction provided.
- Over **40** hours of tutoring.
- **24** hours of additional synchronous instruction for each group throughout AY 2024-25.
- One-on-one speaking and tutoring sessions throughout AY 2024-25.

Questions?

PROGRAM FEATURES

- MOTIVATED & HIGH-ACHIEVING PARTICIPANTS
- LEARNER-CENTERED & TASK-BASED CURRICULUM
- INSTRUCTION BY LANGUAGE EXPERTS
- REAL-WORLD PRACTICE & CULTURAL EVENTS
- CUTTING-EDGE AND MODERN TECHNOLOGY
- PERFORMANCE BASED ASSESSMENT

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