

# HUANG Po-Hsuan

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## ACADEMICS

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| 2020–2023 | <b><u>National Taiwan University</u></b><br><b>MA in Linguistics</b> | GPA 4.19/4.3 |
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Relevant courses: Introduction to Syntax; Introduction to Phonology; Linguistic Fieldwork; Advanced Phonetics; Seminar on Cognitive Linguistics and Psychology; Special Topics on Text Mining and Natural Language Processing; Introduction to Psycholinguistics; Introduction to French Linguistics; Second Language Acquisition; Chinese Phonology; The Use of Ultrasound for Linguistic Research; Language and Society; Physiological Basis and Functions in Speech Production; Research Methodology; Data Analysis and Machine Learning with Python

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| 2015–2020 | <b><u>National Chengchi University</u></b><br><b>BA in English</b><br><b>European Languages and Cultures</b><br><b>(Division of French Language and Culture)</b> | GPA 4.00/4.3 |
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Relevant courses: Introduction to Linguistics; Syntax; Introduction to Phonology; Language and Cognition; Development of the English Language; Conference Presentation and Journal Publication

## RESEARCH EXPERIENCE

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| <b>Speech Behavior and Science Lab (PI: Dr. Chenhao Chiu)</b><br><br>Lab Member & Research Assistant<br><u>Notable projects</u><br><b>High/low vowel differences in laryngeal height and EGG amplitude for different tones</b> <ul style="list-style-type: none"><li>Supervised lab interns on experiment design, experiment conduction, and analyses.</li><li>Developed pipelines for data analysis and visualization for multi-channel data.</li></ul> <b>Lip postures of Taiwan Mandarin High vowels</b> <ul style="list-style-type: none"><li>Developed automated face recognition for linguistic purposes with MediaPipe.</li><li>Designed automated lip landmark tracing for side faces with cluster analysis.</li></ul> <b>Squliq Atayal corpus construction</b> <ul style="list-style-type: none"><li>Labeled 20-hour-long recordings of Squliq Atayal produced by one female informant.</li><li>Cataloged the sound inventory of Squliq Atayal.</li><li>Assisted Squliq Atayal speech auto-segmentation.</li></ul> | <b>Graduate Institute of Linguistics</b><br><b>National Taiwan University</b><br><i>July, 2021–</i> |
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| <b>Prof. Hsuan-Lei Shao</b><br><br>Research Assistant<br><u>Projects</u><br><b>Legal judgment similarity computation</b> <ul style="list-style-type: none"><li>Devised a novel similarity computation based on graph analysis of textual data.</li><li>Overcame the lack of prior-case citations in the continental law system.</li></ul> <b>Association-rule-based domain-specific collocation extraction</b> <ul style="list-style-type: none"><li>Extracted domain-specific collocations in two different corpora (legal judgments and President Jing-Ping Xi's talks) through iterative word re-segmentation based on (average) MI (mutual information).</li><li>Devised an algorithm for (average) MI threshold determination based on mean sentential word ratios.</li><li>Built a package that performs calculation of (average) MI for adjacent bigrams, re-segmentation of the original sentences, and visualization of the sentences as binary trees.</li></ul> | <b>Graduate Institute of Political Science</b><br><b>National Taiwan Normal University</b><br><i>August, 2023–</i> |
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| <b>Prof. Te-Hsin Liu</b><br><br>Research Assistant<br><u>Project</u><br><b>Interaction between L1 transfer and universal constraints for French-speaking Mandarin L2 learners</b> <ul style="list-style-type: none"><li>Conducted thorough literature reviews for weekly seminars.</li><li>Devised and conducted suitable statistical analyses for the corpus data.</li></ul> | <b>Graduate Program of Teaching Chinese as a Second Language</b><br><b>National Taiwan University</b><br><i>July, 2021–October, 2022</i> |
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| <b>Prof. One-Soon Her</b><br><br>Research student<br><u>Project</u><br><b>Classification of Paiwan questions</b> <ul style="list-style-type: none"><li>Conducted a thorough literature review.</li></ul> | <b>Graduate Institute of Linguistics</b><br><b>National Chengchi University</b><br><i>June, 2018–July, 2020</i> |
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- Conducted thorough fieldwork.
- Visualized the prosodic patterns of the collected materials.
- Authored a journal paper.

### **Thesis**

#### **Production and perception of tonal coarticulation in Taiwan Mandarin and Taiwan Southern Min**

- Conducted a thorough literature review and found research gaps.
- Formulated hypotheses pertaining to the research gaps and designed experiments to validate these hypotheses.
- Independently completed three large-scale experiments.
- Devised and conducted suitable statistical analyses for the experiment data.
- Provided explanation for the experiment results.
- Authored a journal paper (in preparation).

### **Course/Personal Projects**

#### **Ultrasonic-and-optical-imaging-assisted automated speech correctness judgment model**

##### **Data Analysis and Machine Learning with Python**

Lecturer: Prof. Tommy C.Y. Ho

Fall semester, 2023

- Conducted a thorough literature review on unfamiliar areas and found research gaps.
- Applied newly learned knowledge and skills to existing expertise; integrated distinct fields with linguistics.
- Designed a sophisticated neural network structure that combines two different forms of data, with a sound identification accuracy of 83%.

#### **Word networks for ill-formed versus well-formed documents in Taiwan Mandarin**

##### **Special Topics on Text Mining and Natural Language Processing**

Lecturer: Prof. Hsuan-Lei Shao

Fall semester, 2023

- Devised a pipeline to collect documents to form corpora with a static crawler.
- Self-taught word-embedding-related techniques.
- Built a word2vec model based on 1,000,000 documents.
- Conducted a thorough literature review on unfamiliar areas and found research gaps.
- Applied word networks to graph analyses.
- Developed a novel kind of word network based on word similarity and compared its properties with conventional word co-occurrence networks.

## **TEACHING EXPERIENCE**

### **Technology of Brain Science**

Lecturers: Prof. Joshua G.O. Soo & Prof. Chia-Lin Lee

Teaching Assistant

- Supervised students' term project progress.
- Provided students with coding assistance.
- Evaluated and graded students.

### **Graduate Institute of Brain and Mind Sciences**

**National Taiwan University**

*Spring semester, 2023*

### **Uncovering Languages**

Lecturer: Prof. Chenhao Chiu

Teaching Assistant

- Supervised students' term project progress.
- Provided students with coding assistance.
- Designed pop-up quizzes and mid-term exams.
- Supervised and led student's discussions in weekly tutorials.
- Evaluated and graded students.
- Prepared class materials.

### **Graduate Institute of Linguistics**

**National Taiwan University**

*Spring semester, 2023*

*Spring semester, 2022*

### **Freshman English**

Lecturer: Prof. Wen-Hsien Hsu

Teaching Assistant

### **Department of Foreign Languages and Literatures**

**National Taiwan University**

*Spring semester, 2021*

*Fall semester, 2020*

- Gave oral presentation tutorials and example presentations.
- Supervised student's mid-term and final presentations.
- Evaluated and graded students.
- Prepared class materials.

## PUBLICATIONS

### Peer-reviewed Journal Articles

Huang, Po-Hsuan and Her, One-Soon. 2023. On a dichotomy of question types: The case of Paiwan. *Concentric: Studies in Linguistics*. To appear.

### Selected Conference Articles

- Huang, Po-Hsuan and Liu, Yi-Chen. 2023, October 21. Ultrasonic-and-optical-imaging-assisted automated speech correctness judgment model. Tunghai International Conference on Second Language Teaching and Research (SLTR.THU). Taichung, Taiwan.
- Chiu, Chenhao and Huang, Po-Hsuan. 2023, August 7–11. Lip postures of high vowels in Taiwan Mandarin. International Congress of Phonetic Sciences (ICPhS). Prague, Czech.
- Huang, Po-Hsuan and Chiu, Chenhao. 2023, August 7–11. Perception of coarticulated tones in Taiwan Mandarin and Taiwan Southern Min. International Congress of Phonetic Sciences (ICPhS). Prague, Czech. [Poster]
- Huang, Po-Hsuan and Chiu, Chenhao. 2023, May 26–27. Tonal coarticulation in Taiwan Mandarin and Taiwan Southern Min. Hanyang International Symposium on Phonetics and Cognitive Sciences of Language (HisPhonCog). Seoul, Korea. [Poster]
- Huang, Po-Hsuan and Chiu, Chenhao. 2022, November 3–4. Articulation and syllabic affiliation of prenuclear glide in Taiwan Mandarin. Ultrafest X: Conference on Ultrasound Imaging for Speech and Language Research. Manchester, United Kingdom.
- Huang, Po-Hsuan, Lai, Jing-Hong and Liu, Te-Hsin. 2022, September 23–25. On the interaction between L1 Transfer and universal constraints – Evidence from the acquisition of Mandarin tones by French speakers. North American Conference on Chinese Linguistics (NACCL). Bloomington, IN, United States.
- Huang, Po-Hsuan and Chiu, Chenhao. 2022, January 6–9. Vowel-glide distinction in high vocoid diphthong structures in Squliq Atayal: An ultrasound and acoustic study. Annual Meeting of the Linguistic Society of America (AML). Washington, DC, United States. [Poster]
- Huang, Po-Hsuan. 2021, October, 23. Vowel-glide distinction in high vocoid diphthong structures in Squliq Atayal: An ultrasound and acoustic study. National Conference on Linguistics (NCL). Taipei, Taiwan.
- Huang, Po-Hsuan and Her, One-Soon. 2021, October 15–16. On a two-way distinction of questions in Paiwan. Young Scholars' Symposium on Taiwan Languages (YSSTL). Online.

### Works in progress

- Huang, Po-Hsuan and Chiu, Chenhao. Production and perception of tonal coarticulation: The cases of Taiwan Mandarin and Taiwan Southern Min. Submitted.
- Huang, Po-Hsuan and Shao, Hsuan-Lei. Comparison between the structures of word co-occurrence and word similarity networks for ill-formed and well-formed texts in Taiwan Mandarin. Manuscript.
- Huang, Po-Hsuan and Shao, Hsuan-Lei. Domain-specific collocation extraction in Mandarin based on iterative average mutual information. In preparation.
- Huang, Po-Hsuan. Improving text classification with construction embedding. In preparation.

## INVITED TALKS

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| Electromyography in linguistics research, Institute of Linguistics, Academia Sinica, Taipei                         | <i>TBA, 2024</i>      |
| Face extraction with MediaPipe in linguistics research, Speech Behaviours and Speech Sciences In-class Talk, Taipei | <i>October, 2023</i>  |
| Face extraction with MediaPipe in linguistics research, MultiMoco NTU Workshop, Taipei                              | <i>November, 2022</i> |
| Using PCA and LDA for ultrasound image classification, the 1 <sup>st</sup> NTU GIL Ultrasound Workshop, Taipei      | <i>November, 2021</i> |

## SERVICE & ACTIVITIES

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| Organizer, Education Camp for Rural Schools, NCCU                 | <i>February–August, 2017</i>         |
| President of Activity, Changhua Student's Association, NCCU       | <i>July, 2017–June, 2018</i>         |
| Vice organizer, Education Camp for Rural Schools, NCCU            | <i>September, 2016–January, 2017</i> |
| Leading actor, Concours universitaire national de théâtre, Taiwan | <i>May, 2017</i>                     |
| Project manager, Education Camp for Rural Schools, NCCU           | <i>August, 2016</i>                  |
| Voluntary after-school tutor, Wanhshing Elementary School, Taipei | <i>Spring semester, 2016</i>         |

## SKILLS & KNOWLEDGE

Languages: Mandarin (native); Southern Min (native); English (advanced); French (advanced); Spanish (basic)

Programming languages/software: Python; R; Javascript; Praat Script; Psychopy; E-Prime; Matlab; bash

Packages/modules:

- Data analyses: numpy; scikit-learn; statsmodels; pandas; lme4
- Visualization: matplotlib; seaborn; plotly

- Image processing: OpenCV; MediaPipe
- Acoustic analyses: parselmouth; wave
- Others: tensorflow; jieba; ckip; tkinter; PyPI; cython, git

Statistical analyses: fundamental analyses (e.g., t-test, ANOVA); dimensionality reduction (including PCA, LDA, etc.); regression/modeling (including linear/logistic regression, LMM, GLM, GAMM, etc.), cluster analysis (hierarchical; K-Means); correlation-related analyses (including fundamental correlation analyses, CCA, Apriori Alogrithm, mutual information, etc.); basic graph analyses

Machine learning: linear/logistic regression; SVM; decision tree; random forest; KNN; neural networks (including CNN, spatial-transformer network, RNN, GAN, etc.)

Laboratory instrumentation: ultrasound; electromyography; electroglottography