

HUANG Po-Hsuan

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ACADEMICS

2020–2023	<u>National Taiwan University</u> MA in Linguistics	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

2015–2020	<u>National Chengchi University</u> BAs in English European Languages and Cultures (Division of French Language and Culture)	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

Speech Behavior and Science Lab (PI: Dr. Chenhao Chiu) Lab Member & Research Assistant <u>Notable projects</u> High/low vowel differences in laryngeal height and EGG amplitude for different tones <ul style="list-style-type: none">Supervised lab interns on experiment design, experiment conduction, and analyses.Developed pipelines for data analysis and visualization for multi-channel data. Lip postures of Taiwan Mandarin High vowels <ul style="list-style-type: none">Developed automated face recognition for linguistic purposes with MediaPipe.Designed automated lip landmark tracing for side faces with cluster analysis. Squliq Atayal corpus construction <ul style="list-style-type: none">Labeled 20-hour-long recordings of Squliq Atayal produced by one female informant.Cataloged the sound inventory of Squliq Atayal.Assisted Squliq Atayal speech auto-segmentation.	Graduate Institute of Linguistics National Taiwan University <i>July, 2021–</i>
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Prof. Hsuan-Lei Shao Research Assistant <u>Projects</u> Legal judgment similarity computation <ul style="list-style-type: none">Devised a novel similarity computation based on graph analysis of textual data.Overcame the lack of prior-case citations in the continental law system. Association-rule-based domain-specific collocation extraction <ul style="list-style-type: none">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).Devised an algorithm for (average) MI threshold determination based on mean sentential word ratios.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.	Research Center for Digital Law National Taiwan University <i>August, 2023–</i>
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Prof. Te-Hsin Liu Research Assistant <u>Project</u> Interaction between L1 transfer and universal constraints for French-speaking Mandarin L2 learners <ul style="list-style-type: none">Conducted thorough literature reviews for weekly seminars.Devised and conducted suitable statistical analyses for the corpus data.	Graduate Program of Teaching Chinese as a Second Language National Taiwan University <i>July, 2021–October, 2022</i>
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Prof. One-Soon Her Research student <u>Project</u> Classification of Paiwan questions <ul style="list-style-type: none">Conducted a thorough literature review.	Graduate Institute of Linguistics National Chengchi University <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]

Wang, Chi-Wei, Chen, Bo-Wei, Huang, Po-Hsuan, Lai, Ching-Hung, and Chiu, Chenhao. 2023, May 26–27. Evaluating forced alignment for under-resourced languages: A test on Squliq Atayal. 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, Ching-Hung 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

Electroglottography in linguistics research with Python, Institute of Linguistics, Academia Sinica, Taipei	March, 2024
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Face extraction with MediaPipe in linguistics research, Speech Behaviours and Speech Sciences In-class Talk, Taipei	October, 2023
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Face extraction with MediaPipe in linguistics research, MultiMoco NTU Workshop, Taipei	November, 2022
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Using PCA and LDA for ultrasound image classification, the 1 st NTU GIL Ultrasound Workshop, Taipei	November, 2021
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SERVICE & ACTIVITIES

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

Packages/modules:

- Data analyses: numpy; scikit-learn; statsmodels; pandas; networkx, lme4
- Visualization: matplotlib; seaborn; plotly
- Image processing: OpenCV; MediaPipe; ffmpeg
- Acoustic analyses: parselmouth; wave
- Text mining: jieba; ckip; gensim
- Others: tensorflow; tkinter; PyPI; cython, git

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

Data structures & Algorithms: linked list, tree, array, A* pathfinding

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

Laboratory instrumentation: ultrasound; electromyography; electroglottography