NATIONAL TAIWAN NORMAL UNIVERSITY

NEWSLETTER

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NTNU PUSHES THE BOUNDARIES OF LINGUISTIC RESEARCH

NTNU NEWSLETTER

A Word from the Publisher

Cheng-Chih Wu
President, National Taiwan Normal University

In the breakthrough development of mRNA vaccines, the unprecedented level of global collaboration by scientists has been likened to a relay race, wherein scientists ran strong legs while also passing along the baton by sharing their discoveries. Funding from governments and private entities played a critical role as well. The COVID-19 pandemic has highlighted how people work astoundingly better and faster when we do it together. We neglect this collaborative spirit at humanity's peril, now more than ever.

Thus, an engaging environment conducive to interdisciplinary research is an important criterion for National Taiwan Normal University. Unimpeded by pandemic restrictions, this university is using creative means to build new bridges and strengthen existing infrastructure to foster research collaborations, including across different fields. With funding from the Ministry of Education, the Yushan Scholars Project by our team at NTNU and an open access multi-purpose platform being developed with the Chinese Language and Technology Center are just two examples in NTNU's strategic plan for the future of the university and the advancement of research on a global scale.

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2021 RANKINGS

THE WORLD UNIVERSITY RANKINGS

1st in International Outlook among Taiwanese Universities

25th in Education

104th in Asian University Rankings

QS WORLD UNIVERSITY RANKINGS Ranked 2021

334 Overall

28th in Education

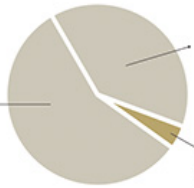
98th in Modern Languages

53rd in Linguistics

61st in Asian University Rankings

STUDENTS

Total / 14816



8315 Undergraduates (918 intl. students)

5717 Graduates (664 intl. students)

784 Overseas Chinese Students in Preparatory Programs

FACULTY

Total / 1511

3 Nobel Prizes held by current faculty

17.55 : 1 student to faculty ratio

CAMPUS

131 acres

3 campuses

ACADEMICS

9 Colleges

63 departments

1 affiliated senior high school

A Word from the Editor-in-Chief

Frank Yung-Hsiang Ying (EVP)

In *Language, Bananas and Bonobos: Linguistic Problems, Puzzles and Polemics*, British linguist Neil Smith poses a query: "How to be the center of the universe?" His answer: "Be a linguist." As a unique feature that distinguishes humans from other beings, language and its understanding have the ability to link every aspect of humanity. Linguistics exemplifies how research of all kind and scope can benefit from each other. NTNU champions interdisciplinary research in Chinese language study, technology, teaching platforms and curriculum development, and pedagogy, among many other aspects within this multi-faceted discipline.

This issue features two NTNU alumni whose linguistic discoveries paved the way for exciting research developments now, and not only in linguistics. As a graduate of NTNU and MIT, Professor James Huang has paid close attention to the progress of linguistic research in Taiwan even while working abroad. Currently on leave from his post as Professor of Linguistics at Harvard University, Dr. Huang will be working closely with faculty at NTNU and other institutions to deepen research collaborations and cultivate talents in academia. Professor Chiu-yu Tseng, retired Distinguished Research Fellow at Academic Sinica, revolutionized prosody analysis and created verified models and methods never before known to the global speech research community. Her work in the prosodic modeling of signals significantly impacted engineering and Big Data management, etc. We hope that readers will gain a new vision for how learning and research can and do transcend organizational nomenclatures to realize our innovative potential that is not possible without each other.

NTNU PUSHES THE BOUNDARIES OF LINGUISTIC RESEARCH

It is our use of language that, perhaps more than anything, distinguishes us from other species. With linguistics so central to the human experience it is unsurprising that, as an academic discipline, it draws from both the humanities and the hard sciences. Paired with almost any field, it forms an exciting sub-field of learning.

National Taiwan Normal University (NTNU) has had a long tradition of excellence in humanities research and is recognized as a premier higher learning institution for education and language studies. According to the 2021 world university rankings released by analytics tracking firm Quacquarelli Symonds, NTNU has demonstrated outstanding achievements in the fields of philology and continues to track as one of Taiwan's most influential and recognizable universities. NTNU's College of Liberal Arts enjoys an especially rich academic and research tradition, leading the way in areas of sociolinguistics, linguistic fieldwork, historical linguistics, grammar and stylistics, phonetics, neurolinguistics, evolution of language, psycholinguistics, and AI and computational linguistics as illustrated in Figure 1, adapted from Neil Smith's *Language, Bananas and Bonobos* (2002):

The emergence of the Internet, the rise of large search engine companies, along with advancements in areas of speech synthesis and recognition technology have dramatically redefined not only interpersonal communication, but the speed and manner with which we acquire information. Language technology, with its focus in both the humanities and the sciences, is one of the fastest growing areas in the field of integrated science. To meet these academic and technological trends, the Ministry of Science and Technology (MOST) funded the development of the NTNU Institute for Research Excellence in Learning Sciences and the NTNU Chinese Language and Technology Center—both of which have become wellsprings for the research and promotion of language and learning. NTNU's achievements in introducing internationalization and interdisciplinary focus into its curricula not only points to its strength in traditional disciplines, but also its efforts in cutting-edge research. Another major aspect of NTNU's success has been its celebrated alumni network upon which the fame and reputation of NTNU continues to grow.

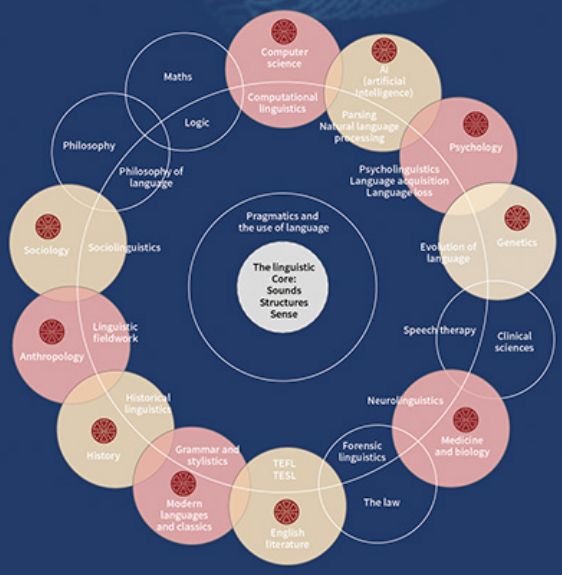


Figure 1. The colored circles indicate areas in which NTNU has contributed significant research in the field of linguistics.

Yushan Scholar Leads NTNU's Evolving Linguistic Studies

To strengthen the competitiveness of Taiwan's higher education system and promote the quality of its instruction and research, in 2018 the Ministry of Education (MOE) launched the Yushan Scholars Project. The goal was to help Taiwan's elite universities recruit top international talent by offering compensation packages that meet international benchmarks. The influx of the world's brightest minds will allow new ideas and teaching methods to take root in Taiwan's educational environment, while elevating the international standing of Taiwan's higher education system as a whole. In 2021, NTNU invited Dr. Cheng-Teh James Huang, an alumnus of its Department of English and a current professor of linguistics at Harvard University, to become its first Yushan Scholar Distinguished Chair. Under the Yushan Scholars Project, for a period of three years Dr. Huang will partner with NTNU professors alongside researchers at other major institutions abroad on a number of initiatives. The results will hopefully raise Taiwan's academic profile and reputation, as well as deepen interdisciplinary research and cultivate talents in the field of linguistics in Taiwan.

The interconnective and mutually validating relationship between linguistics and its sub-fields have created a highly interdisciplinary field of academic development that has the potential to stimulate areas of forward-looking research not traditionally associated with linguistics, such as brain research. Starting from the theoretical foundation of universal grammar and its ensuing interdisciplinary directions, internationally renowned expert in grammar theory, Dr. Huang, is set to lead teams of NTNU researchers in the areas of theoretical linguistics, applied linguistics, and neurobrain linguistics. In theoretical linguistics, NTNU professors of the Department of English and the Department of Taiwan Culture, Language and Literature will explore topics in syntax and semantics; in applied linguistics, research will be conducted in foreign languages and corpus linguistics, while neurolinguistics will focus on the processes and mechanisms of acquisition, comprehension, and the regression of language from a biological perspective (Figure 2). The Yushan Scholars Project is set to bring together researchers of international renown from across Taiwan and the world for what is to be a period of deep academic inspiration, discovery, and learning. Not only burnishing NTNU's reputation for academic excellence, this period of interdisciplinary cooperation is likely to inspire new fields of research and encourage new scholars to join the field.

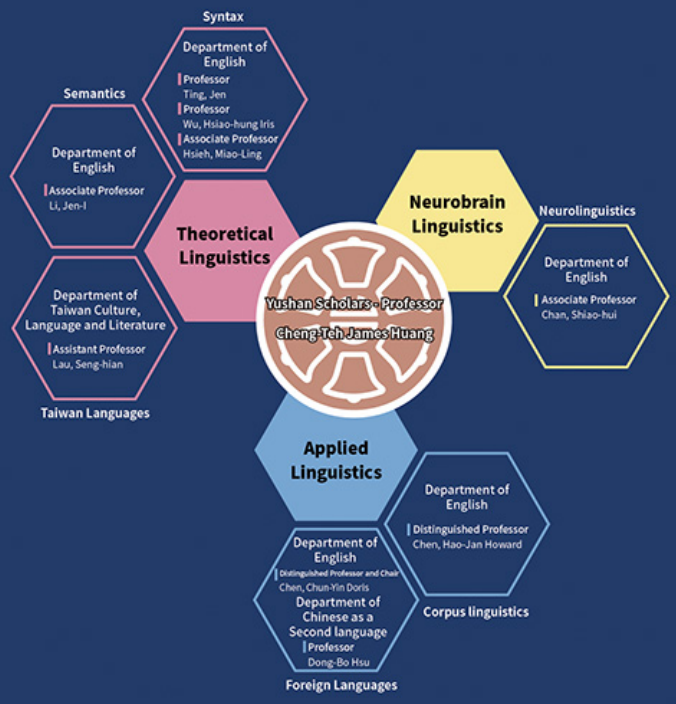


Figure 2. Yushan Scholars Project – NTNU Team

Platform for Greater Interdisciplinary Research

The research partnerships fostered through Dr. Huang's coordination in the Yushan Scholars Project also brings greater visibility to developments at the Chinese Language and Technology Center (CLTC). Specifically, the Yushan Scholars Project has assisted the CLTC in the construction of its Language and Technology Online Work Platform. The platform, slated to go online in 2022, aims to assist professors and students in the humanities in important interdisciplinary research. Bringing together classical works and linguistic tools developed by experts in the fields of linguistics and information technology, it looks to overcome the reticence of those in the humanities regarding the study or use of the natural sciences. As the foundation for this developing platform, the CLTC has already established Taiwan' most complete native speaker corpus (2 billion words), Taiwan's largest foreign learner written corpus (5 million words) and Taiwan's largest foreign learner spoken corpus (1.3 million words).

NTNU Alumni on the Cutting-edge of Linguistic Research

In addition to Dr. Huang's numerous advancements in the theory of Universal Grammar (UG), he is the foremost linguist of the Chinese language; the impact and influence of his research have extended into every area of linguistic studies. Meanwhile, Dr. Chiu-yu Tseng successfully elevated traditional empirical phonetic analysis to quantitative approaches, supporting them through predictive models and statistics.

Figures 3 shows Dr. Huang and Dr. Tseng encompass the two main approaches in delving deeper into the field of linguistics. On the theoretical side, Dr. Huang continues to add to current understanding regarding the brain's "mental software" of language use and acquisition through his observations of semantic and syntactic data. Meanwhile, Dr. Tseng has revolutionized phonetic and phonology analyses of realistic speech data through a top-down perspective with great implications and growing relevance for AI and computational linguistics, including for speakers of non-native languages.

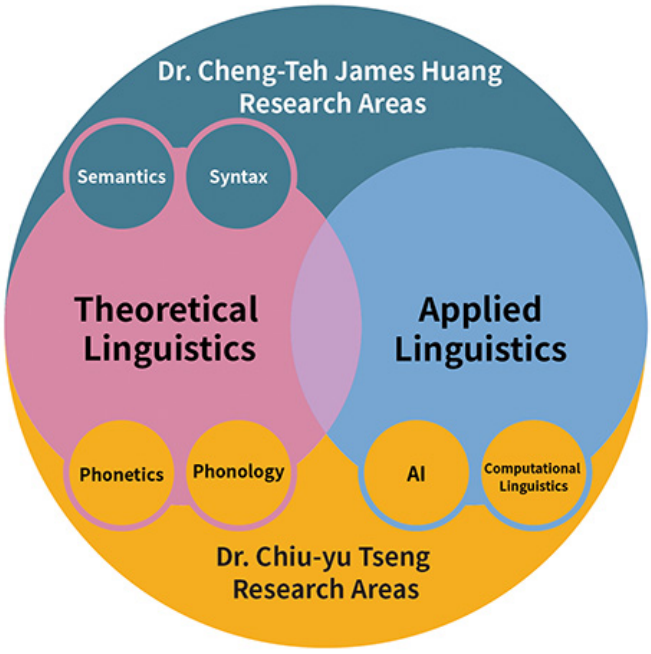


Figure 3. Interface studies by Dr. Huang and Dr. Tseng

World-Renowned Scholar in Grammar Theory

Yushan Scholar - Dr. Huang's research concerns the scientific study of language as a 'mirror of the mind'. By analyzing observable properties of language, linguists try to 'hack' into the brain to account for our knowledge of language. Much of Dr. Huang's research is devoted to the discovery and explanation of language properties that are attributable to Universal Grammar (UG). His discovery of an important law of grammar called the Condition on Extraction Domain (CED) led to Noam Chomsky's (1986) development of the Barriers system, with ensuing effects that make up important topics of research during the rise of Minimalism since the 1990s. CED remains an active topic of research today.

Another area of his research concerns the notion of Logical Form and linguistic typology. From a comparative perspective, Dr. Huang brought to light for the first time certain systematic argument-adjunct asymmetries under movement and attributed the asymmetries to the Empty Category Principle (ECP), a prominent module of the theory of UG at the time. The asymmetries were observed in both languages with wh-movement (like English) and languages whose wh-phrases do not move (they stay 'in situ', as in Chinese). This analysis gave rise to the typological view that languages possess the same set of substantive and formal universals (such as wh-movement) but they differ on a 'derivational timing parameter' on the application of relevant processes. Dr. Huang's work in this area opened a new line of research in the field that has been adopted in the study of numerous wh-in-situ languages, and the LF-movement hypothesis continues to be entertained in much current literature.

Dr. Huang has made contributions to the advancement of Chinese linguistic study with original research on almost every major aspect of Chinese grammar: from phrase structure, passives, relatives, resultatives, to quantification, interrogation, light verbs and decomposition, as well as the interpretation of pronouns (reflexive, bound, or null pronouns) and their antecedents. In recent years, Dr. Huang has elucidated the theory of parameters, capitalizing on the robust analyticity of Chinese syntax and showing how parametric theory may insightfully characterize both synchronic variation and diachronic change. In the research on each topic, it is typical of his work to not only shed new light on some old problems in the traditional field of Chinese syntax but also contribute to current issues in general linguistic theory. Although most of his research is published as individual papers, some of his work can also be seen in the co-authored book *Syntax of Chinese* (Cambridge University Press, 2009) and the collected volume *Between Syntax and Semantics* (Taylor & Francis, 2010). A Festschrifts volume devoted to the theme of *Chinese Syntax in a Comparative Perspective* was published in his honor in 2015 (Oxford University Press).

In addition to linguistic research, for the past 40 years Dr. Huang has also been known for his university teaching and graduate advising. More than 30 students have completed their dissertations under Dr. Huang's mentorship, and quite a few of them have become prominent leaders in their own countries and regions.

Yushan Scholar - Dr. C. - T. James Huang

Yushan Scholar – Dr. C.-T. James Huang is currently Professor of Linguistics at Harvard University as well as a Distinguished Visiting Chair of English at NTNU. He has recently been selected as a Yushan Fellow by the Ministry of Education. Dr. Huang has held teaching positions in several institutions, including the University of Hawaii, NTNU and Tsing Hua University, Cornell University, University of California (Irvine). He was a Guggenheim Fellow in 1989 and was a Fellow of the Center for Advanced Study in the Behavioral Sciences at Palo Alto, California, in 1997-1998. He received the Linguistic Society of Taiwan's Lifetime Achievement award in 2014 and was elected a Fellow of the Linguistic Society of America in 2015. In 2016, he was elected an Academician of Academia Sinica. In 2019 he was elected Member of Academia Europaea (The Academy of Europe).

A Renowned Expert in Phonetics Research

Dr. Tseng's work on computational phonetics, or more precisely prosodic modeling of signals, is highly influential and distinguished in the global speech community. Dr. Tseng was among the earliest scientists to construct speech corpora and analyzed the prosodic (pitch-, duration- and energy-related) events and phenomena within speech signals using engineering approaches and mathematical/software tools. She developed principles and rules for different levels of prosodic events, and the rule-based interactions between these events. These models have never been known by the global speech science research community, but she successfully verified them experimentally with different corpora across different languages, different speakers on different domains in different speaking styles. Such achievements are unique not only in linguistics, but also in the fields of engineering and computer processing of speech signals.

Another major contribution by Dr. Tseng as a research scientist is in the construction of two sets of speech corpora specially designed for prosody investigations. The Sinica COSPRO (Mandarin Continuous Speech Corpora) and Toolkit (10.58GB total, 7.9GB annotated), released in 2006, includes a wide variety of read speech of Mandarin Chinese and by far is still the only Mandarin prosody database. The AESOP-ILAS, part of an international collaboration of the AESOP (Asian English Speech cOrpus Project) consortium of L2 English by Taiwan Mandarin speakers (13.9GB total, 540 speakers, 815 hours) was released in 2015. AESOP-ILAS is of special importance due to the recent shift of L2 literature that began to recognize how L2 prosody could impede intelligibility as much as segmental deviations from the norm, and the pressing need to develop CALL systems for L2 learners. These two corpora are useful towards cross-genre and cross-linguistic comparative studies for both basic research and technology development.

Contrary to traditional acoustic phonetic investigations that dissect small amounts of speech output signals into minute pieces and make close observations of their changes and patterns, Dr. Tseng was confronted with the quantity of speech data and research questions directed towards modeling and implementation from the community of speech technology development. Large amount of realistic speech data was collected outside soundproof rooms and required explanation. She therefore embarked on a journey to incorporate methods of data analysis from corpus linguistics and quantitative analyses and computational modeling from computational linguistics. To that end, she successfully elevated traditional empirical phonetic analysis to quantitative approaches and was able to prove her hypotheses with statistics; at the same time, she was also able to test her hypothesis using predictive models. She was also one of the very few in the field who took to analyzing continuous speech rather than minute segments, and accounted for how abstract phonological units must go through modifications when additional syntactic and discourse functions are superimposed on to those abstract units and how contributions from upper levels could be statistically analyzed. She began her research on speech prosody in the 1990's and until 2018 has pretty much provided evidences of how the melodic and temporal construction in continuous speech could be explained by patterns of multiple-phrase speech paragraphs that could be attributed to cross-phrase associative patterns (2004) rhythm adjustments (2014), pitch variation (2008), emphases and reductions (2018). Furthermore, she was subsequently able to account for the acoustic patterns of information structure and weighting assignments through implementations of highlighting as Figure 4 illustrates the Chunking, Phrasing and Global Associative Patterns. All phrase intonations collectively reflect linear adjacency and cross-over association and perceived global pitch contour trajectories (Tseng et al., 2004; Tseng, 2006), and Information Weighting includes Highlights and Reductions.

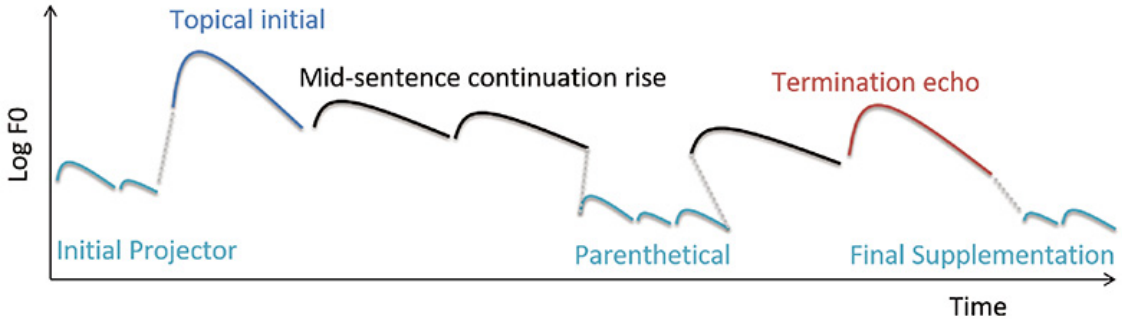
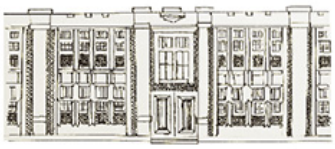


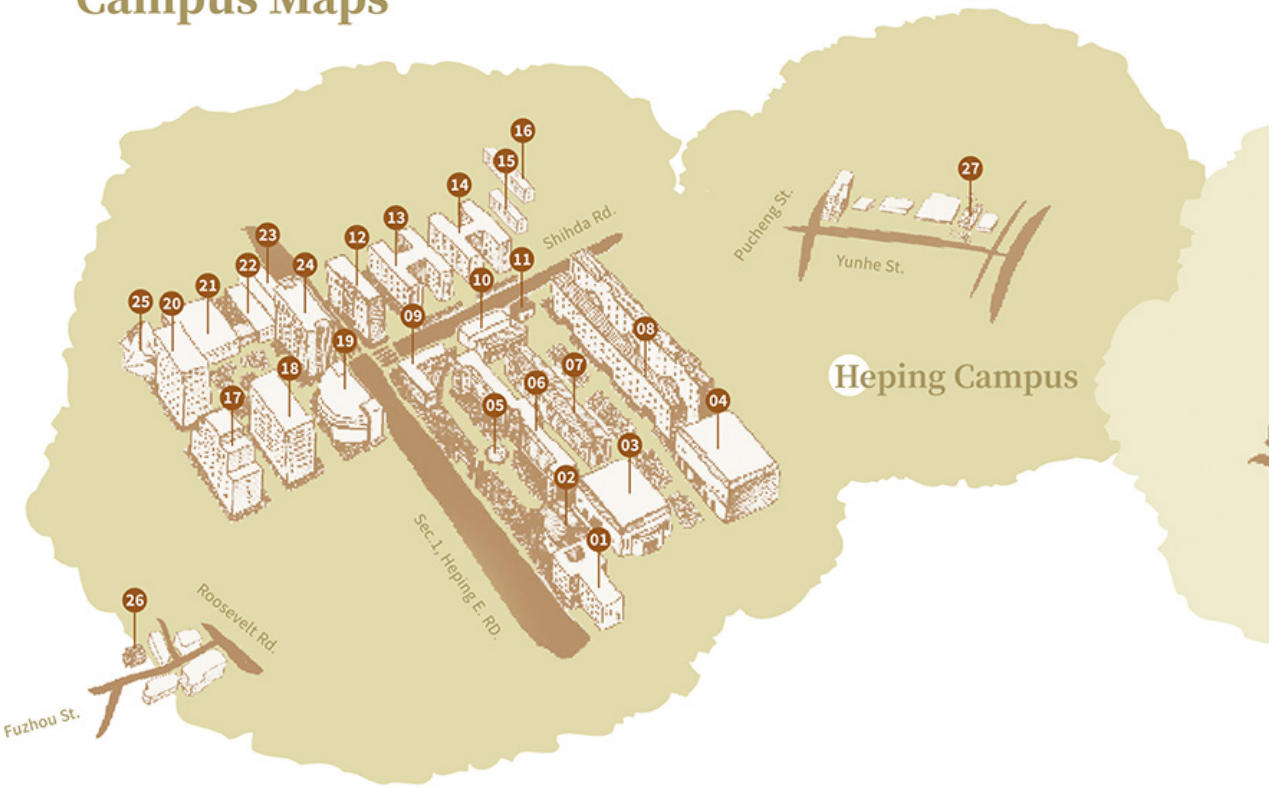
Figure 4. Prosody template of a multi-phrase speech paragraph that includes cross-phrase discourse association as well as deployment of information structure.

Dr. Chiu-yu Tseng

Dr. Chiu-yu Tseng retired Distinguished Research Fellow at Academic Sinica, Taiwan, is an internationally renowned linguist and speech scientist for her distinctive contributions to interdisciplinary research of language and speech technology development. Her major achievements include contributions as a research scientist and as an academic leader, exemplified by her active role in elevating Oriental-COCOSDA from an informal association to a lasting forum of international standing to connect under-resourced regions in Asia with the global speech community. Among the academic awards she has received, most notably are (1) the Antonio Zampolli Prize (2012, with Shuichi Itahashi and Satoshi Nakamura)--for "Outstanding Contributions to the Advancement of Language Resources & Language Technology Evaluation within Human Language Technologies" and (2) ISCA (The International Speech Communication Association) Fellow, 2016.



Campus Maps



01	Music Building
02	Audiorium
03	Gymnasium
04	Swimming Pool
05	Circle
06	Administration Building
07	General Building
08	College of Liberal Art
09	Yaojhih Building
10	Wen-Huei Hall
11	Health Center
12	Fine Arts Building
13	Men's Dorm 1
14	Women's Dorm 1
15	College of Management
16	College of Music
17	In-sevice and Continuing Education Building
18	Bo-Ai Building
19	Library
20	Educational Building
21	Science and Technology Building
22	Mechanical Engineering Building
23	International Conference Center
24	General Building
25	NTNU Museum
26	Japanese-style dormitory at 11 Fuzhou Street
27	Liang Shiqiu's former residence

Gonguan Campus

Linkou Campus

01	Administration Building
02	Jhongjheng Hall
03	General Hall
04	Mathematics Building
05	Science Education Building
06	Branch Library
07	Graduate Student Dormitory
08	Cheng Building
09	Applied Science Building
10	College of Science Building
11	Student Dorm 7
12	Parade Platform
13	Gymnasium
14	Lecture & Research Building

01	Administration Building
02	Audiorium
03	Belfry
04	Gymnasium
05	Lecyun Intruction Building
06	Jingye Intruction Building
07	Teacher Research Center
08	Science Building
09	Liberal Education Building
10	Atrium Garden
11	Library
12	Student Dorm (Cin Building)
13	Student Dorm (Pu Building)
14	Student Dorm (Chen Building)
15	Student Restaurant
16	Health Building
17	Student Dorm (Jheng Building)
18	Visiting Scholars Guest House
19	Faculty Residence
20	Information and Academic Building

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