Minkyu Kim

Curriculum Vitæ

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Education

2019–2025 **Ph.D. & M.S.**, *University of California, Irvine*, United States
Joint M.S. in Statistics and Ph.D. in Cognitive Sciences Program

2012–2019 **B.S. & B.A.**, *Seoul National University*, South Korea
B.S. in Chemistry and B.A. in Linguistics (Honors: *cum laude*)

2013 Exchange Research Student, *Shanghai Jiao Tong University*, China (PRC)

PhD Dissertation

title *Evidence for Segregated Cortical Pathways for Prosodic and Segmental Control in Speech*

supervisor Dr. Gregory Hickok

description This thesis examines the neural mechanisms of human speech production, asking whether prosodic control (e.g., pitch, largely laryngeal) and segmental control (e.g., consonants and vowels, largely supralaryngeal) are supported by distinct cortical pathways. Drawing on two complementary fMRI paradigms, this study provides evidence for a functional segregation of speech motor networks within the frontal and temporal lobes, with particular attention to prosody-related functions in the dorsal premotor cortex. These findings advance understanding of the neural basis of fluent speech and motivate pathway-specific targets for diagnosis and intervention in motor speech and prosodic disorders.

Professional Experiences

2026–pres. **Interim Postdoctoral Scholar**, *University of California, Irvine*

2019–2023 **Teaching Assistant**, *University of California, Irvine*

Honors and Awards

2024 **The Tarow and Minako Indow Fellowship for Research Excellence**, *Department of Cognitive Sciences*, UC Irvine
Stipend of USD 7,000

2024 **Graduate Division Completion Fellowship**, *Graduate Division*, UC Irvine
Full tuition and additional stipend of USD 9,500 for 1 quarter

2019 **Graduate Dean's Recruitment Fellowship**, *School of Social Sciences*, UCI
Full tuition and additional stipend for 3 quarters (1 academic year)

2012–2017 **Presidential Science Scholarship**, *Korea Student Aid Foundation*, South Korea
Full tuition and additional stipend for 8 semesters (4 academic years)

2016 **Dean's list**, *College of Natural Sciences*, Seoul National University

Publications

[1] S. Ryun, M. Kim, and C. K. Chung. Cortical maps of somatosensory perception in human. *NeuroImage*, 276:120197, 2023.

[2] M. Kim, H. Byun, G. Choe, and G. Yurn. A quantitative study on the 'phags-pa script. *SCRIPTA*, 10:1–76, 2018.

[3] J. Lee, M. Kim, H. Ko, J. Kim, Y. Kim, and K. Shin. Electrowetting technique for measuring the thickness of spin-coated hydrophobic fluoropolymer films. *Sci. Adv. Mat.*, 7(5):869–873, 2015.

[4] O. S. Kwon, M. Kim, T. Kim, C. Lee, S. Han, and K. Shin. Reversibility of electrowetting on hydrophobic surfaces and dielectrics under continuous applied dc voltage. *J. Nanosci. Nanotechnol.*, 11(8):7132–7136, 2011.

Ongoing Projects

Segregated Cortical Pathways for Prosodic and Segmental Control

Status — Data collection complete ($N = 50$); data analyses underway.

Methods — Two task-based fMRI experiments.

Description — Continuation of my PhD dissertation, consisting of two complementary fMRI paradigms that probe prosodic versus segmental control in speech. Aims are to (1) replicate and extend evidence for functional segregation of speech motor networks in frontal and temporal cortex and (2) map pathway-specific contributions to fluent production and prosodic modulation.

Temporal Dynamics of Prosodic and Segmental Control in Speech

Status — Data anlaysis underway; new protocols under development.

Methods — Intracranial SEEG (Stereoelectroencephalography).

Description — SEEG study applying the same altered-auditory-feedback paradigm used in our fMRI work to patients undergoing invasive monitoring for epilepsy. Goals are to (1) precisely localize cortical loci involved in prosodic/laryngeal control and (2) obtain high-temporal-resolution electrophysiological signatures (timing, oscillatory dynamics) of pitch control during production. This bridges the spatial maps from fMRI with millisecond-level temporal dynamics from SEEG.

Collaborators — Alexander Himstead, MD; Kurt Qing, MD, PhD. (UC Irvine Hospital)

Cortical Mechanisms of Rhythm-Based Motor Synchronization

Status — Data collection underway (target $N = 50$).

Methods — Task-based fMRI.

Description — A within-scanner rhythm synchronization study testing whether a domain-general rhythm processing/motor-control hub supports both oral (tongue-click) and manual (button-press) synchronization. Participants synchronize to continuously varying beats by performing either tongue-clicks or button-presses, allowing direct comparison of modality-specific motor output and modality-general timing control.

Presentations

Poster

"Evidence of distinct speech control pathways for prosody and syllabic articulations using speech repetition under fMRI", Society for Neuroscience, San Diego, CA, Nov 2025.

"Prosodic and Phonetic Coordination of Speech: fMRI Evidence for Parallel Circuits", Society for Neurobiology of Language, Washington D.C., Sep 2025.

"Neural Pathways of Vocal Pitch Modulation: An fMRI Study", Society for Neuroscience, Chicago, IL, Oct 2024.

Oral

"Datives in Dependent Case Theory: Lexical, Dependent, or Unmarked?", The 13th Formal Description of Slavic Languages, Göttingen, Dec 2018.

"Some issues on the inconsistency of the inventory of the 'Phags-Pa script", The 60th Annual Meeting of the Permanent International Altaistic Conference, Székesfehérvár, Aug 2017.

Professional Membership

Member, the Society for Neuroscience

Member, the Society for the Neurobiology of Language

Mentoring

Undergraduate Research Assistants

2026	Janelle Franco
2025	Lydia Cheng, Trisha Le
2024–2025	Wandy Kongmebhol, Andre Musaderyan, Janaki Raghavan Nair, Bianca Rios, Emily Perez Wong, Chen Chi

Leadership

2023–2025 **Chair**, *Korean Graduate Students Association at UC Irvine*

Military Service

2014–2016 Sergeant, *Republic of Korea Army*
Honorably discharged Jan 20, 2016.

Computer Skills

statistics R, SPSS

programming Python, C/C++, MATLAB, SQL, LaTeX

web dev. HTML, CSS, Javascript, and basic skills in various AWS products

Language Proficiency

fluent Korean (native), English

intermediate Mandarin Chinese, Japanese

basic German, Swedish, Russian, Finnish

I ka ʻōlelo nō ke ola, i ka ʻōlelo nō ka make
In language there is life, in language there is death.

(Hawaiian proverb)