

# JAEKOO KANG, Ph.D.

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## EDUCATION

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2021	<b>Ph.D., Speech-Language-Hearing Sciences, USA</b> The Graduate Center, City University of New York
2016	<b>M.A., English Linguistics (ABD), Korea</b> Korea University, Seoul, Korea
2014	<b>B.A., English Language and Literature, Korea</b> Korea University, Seoul, Korea (Graduated with Great Honor)

## RESEARCH INTERESTS

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- Speech production, articulatory phonology and phonetics
- Variability and flexibility in skilled articulatory actions
- Uncontrolled Manifold Framework
- Articulation-Acoustics Mapping & Inversion
- Machine learning, deep learning, and computational modeling in speech sciences

## PEER-REVIEWED JOURNAL ARTICLES

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- Roon, K. D., Chen, W.-R., Iwasaki, R., **Kang, J.**, Kim, B., Shejaeya, G., Tiede, M. K., & Whalen, D. H. (2022). Comparison of auto-contouring and hand-contouring of ultrasound images of the tongue surface. *Clinical Linguistics & Phonetics*, 36(12), 1112–1131.
- Lee, S., **Kang, J.**, & Nam, H. (2020). Identification of English vowels by non-native listeners: Effects of listeners' experience of the target dialect and talkers' language background. *Second Language Research*, 1–27.
- Roon, K. D., **Kang, J.**, & Whalen, D. H. (2020). Effects of Ultrasound Familiarization on Production and Perception of Nonnative Contrasts. *Phonetica*, 77(5), 350–393.

## CONFERENCE PROCEEDINGS

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- **Kang, J.**, Nam, H., & Whalen, D. H. (2020). Estimating the “good” variability in speech production using invertible neural networks. 12th International Seminar on Speech Production.
- **Kang, J.**, Nam, H., Chen, W., & Whalen, D. H. (2019). Benign vs. harmful variability in second language vowel production. Proceedings of International Congress of Phonetic Sciences 2019.
- Whalen, D. H., **Kang, J.**, Iwasaki, R., Shejaeya, G., Kim, B., Roon, K. D., Mark, K., Preston, J. L., Phillips, E., McAllister, T., & Boyce, S. E. (2019). Accuracy Assessments of Hand and Automatic Measurements of Ultrasound Images of the Tongue. Proceedings of International Congress of Phonetic Sciences 2019.

- Chen, W.-R., Tiede, M., **Kang, J.**, Kim, B., & Whalen, D. H. (2019). An electromagnetic articulography-facilitated deep neural network model of tongue contour detection from ultrasound images. *The Journal of the Acoustical Society of America*, 146(4), 3081–3081.
- **Kang, J.**, Whalen, D. H., & Nam, H. (2018). The effect of native language on the second language vowel variability. *The Journal of the Acoustical Society of America*, 144(3), 1868.
- Chen, W., Saltzman, E., Nam, H., & **Kang, J.** (2018). Benign vs. destructive variability in speech production: an uncontrolled manifold approach. *UConn Language Fest*.
- **Kang, J.**, Whalen, D. H., & Nam, H. (2017). Non-linear dimensionality reduction for correlated tongue measurement points. *The Journal of the Acoustical Society of America*, 141(5), 3581–3581.
- Nam, H., **Kang, J.**, & Saltzman, E. (2017). Uncontrolled manifold method to speech production. *The Journal of the Acoustical Society of America*, 141(5), 3584–3584.
- You, H., Yang, H., **Kang, J.**, Cho, Y., Hwang, S. H., Hong, Y., Cho, Y., Kim, S., & Nam, H. (2016). Development of articulatory estimation model using deep neural network. *Phonetics and Speech Sciences*, 8(3), 31–38.

## EXPERIENCE

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2022 – 2024	<p><b>Director of AI Research, Korea</b> i-Scream arts</p> <p>Let a team in developing multimodal AI solutions for digital drawing analysis and psychological evaluation. Focused on user sentiment analysis through AI-based image color and sketch element analysis.</p>
2021 – 2022	<p><b>AI Researcher, Korea</b> i-Scream kids</p> <p>Designed and implemented AI engines for social network applications, enhancing user experience and platform interactivity.</p>
2016 – 2021	<p><b>Research Assistant, CUNY, USA</b> Speech-Production-Acoustics Perception Lab, CUNY</p> <p>Collaborated on projects involving articulatory phonology and motor control with Dr. Douglas H. Whalen, contributing to understanding speech variability and perception.</p>
2021 – 2022	<p><b>Research Assistant, Haskins Laboratories, USA</b> Haskins Laboratories</p> <p>Focused on speech production and perception research, particularly on articulatory variability in native and non-native speakers (EMA, Ultrasound utilized).</p>
2021 – 2022	<p><b>Research Assistant, Korea</b> EMCS/NAMZ Labs</p> <p>Conducted research in automatic speech recognition and synthesis, contributing to advancements in language processing technologies.</p>

## INVITED TALKS

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- Guest lecturer (2020). Articulatory Phonology Fall 2020, The Graduate Center, CUNY  
An introduction to TADA, the Haskins Laboratories Task-Dynamics Application.
- Guest lecturer (2018). The Graduate Center, CUNY  
An introduction to PsychoPy3 for designing your own online experiment
- Guest lecturer (2018). Doctoral Research Spring 2018, The Graduate Center, CUNY  
Designing behavioral experiments using Psychopy3 and analysis using Matlab

## AWARDS & SCHOLARSHIPS

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- Dissertation Fellowship (2020). The Graduate Center, CUNY
- Doctoral Student Research Grant (2019). The Graduate Center, CUNY
- The Moe and Hannah Bergman Award for Conference Travel (2017, 2019). The Graduate Center, CUNY
- Award of the Best Student Paper (2015). International Conference on Speech Sciences, Seoul, Korea
- Research Assistant Scholarships (2014, 2015). Korea University, Seoul, Korea
- Graduation with Great Honor (2014). Academic Affairs, Korea University, Seoul, Korea

## SKILLS & ABILITIES

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- Programming: Python, MATLAB, R, Praat scripting, vanilla JS, React, SQLite, basic C++
- Machine Learning & Deep Learning: TensorFlow, PyTorch, Sklearn, LangChain, various LLM APIs
- Speech Recognition & Processing: HTK, Kaldi, Espnet, Transformer-based models
- Experimental Design & Data Analysis: MATLAB, Python, PsychoPy, jsPsych
- Data Visualization: Plotly, basic D3.js, Observable
- Productivity Tools: Notion, Slack, Jira; basic Figma

## PATENTS

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- System and method for providing AI stress-related psychological examination service. **Kang et al.** 1026989840000. Granted: 2024.08.21
- Method for analyzing visual perception processing ability and spatiotemporal composition ability based on digital figure inspection. **Kang et al.** Korea Patent No. 1026833910000. Granted: 2024.07.04
- Method for analyzing a user's emotions from their drawing data. **Kang et al.** Korea Patent No. 1026736890000. Granted: 2024.06.04
- Method for analyzing the emotions of infants and children based on multiple drawing data. **Kang et al.** Korea Patent No. 1026736900000. Granted: 2024.06.04
- A method for analyzing a user's emotions based on the color scheme of user-generated images. **Kang et al.** Korea Patent No. 1026736860000. Granted: 2024.06.04
- User sentiment analysis method using color analysis module. **Kang et al.** Korea Patent No. 1026403500000. Granted: 2024.02.20
- Method for developing Color Emotion Model, CEM. **Kang et al.** Korea Patent No. 1026552700000. Granted: 2024.04.02
- A Systematic Method of Analyzing Digital Drawings using AI. **Kang et al.** Korea Patent No. 1025480740000. Granted: 2023.06.22
- Method and System of AI-based Image Color Analysis. **Kang et al.** Korea Patent No. 1025022100000. Granted: 2023.02.16

- A method for analyzing a user's emotions using multiple images created by the user. **Kang et al.** Korea Patent No. 1026736880000. Granted: 2024.06.04
- System for analyzing a user's emotions from drawing data. **Kang et al.** Korea Patent No. 1026736910000. Granted: 2024.06.04
- A method for analyzing a user's emotions by extracting sketch elements, monochromatic and color scheme adjectives, color elements, and emotional elements from an image, and then using these elements as a basis for the analysis. **Kang et al.** Korea Patent No. 1026736870000. Granted: 2024.06.04
- How to generate color usage degree, color characteristic distribution map and word cloud as result data according to color analysis of picture data. **Kang et al.** Korea Patent No. 1025215920000. Granted: 2023.04.10
- A method for analyzing the user's personality based on the output data in the form of visual feedback. **Kang et al.** Korea Patent No. 1025215930000. Granted: 2023.04.10
- A system that analyzes picture colors and analyzes users based on artificial intelligence. **Kang et al.** Korea Patent No. 1025215940000. Granted: 2023.04.10
- How to analyze colors applied to objects in user drawing data. **Kang et al.** Korea Patent No. 1025215910000. Granted: 2023.04.10
- How you can analyze a user's based on the usage information and picture data for each production tool used in the process of creating the picture data. **Kang et al.** Korea Patent No. 1025555800000. Granted: 2023.07.11
- A picture analysis system using a digital drawing tool that allows users to analyze picture data produced using a digital drawing tool. **Kang et al.** Korea Patent No. 1025555790000. Granted: 2023.07.11