

# SHU SAKAMOTO

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**Research Keywords:** Neuroscience & Music (Neuromusic), Auditory System, Music Cognition, Emotion, Expectation, EEG, Neural Oscillation, Brain-Computer Interface

## EDUCATION

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- 2020 – Present      **Graduate School of Media and Governance, Keio University**  
**GAO Scholar (Full Scholarship)**  
Research Topic:      Neuroscience and Music  
Research Supervisor: Dr. Shinya Fujii, Dr. Atsuhiko Aoyama  
GPA:                      3.71
- 2017 – 2020      **Faculty of Environment and Information Studies, Keio University**  
**Bachelor's-Master's Four-Year Integrated Education Program**  
**Excellent Graduation Project**  
Research Topic:      Neuroscience and Music  
Research Supervisor: Dr. Shinya Fujii, Dr. Atsuhiko Aoyama  
GPA:                      3.86

## WORK/VOLUNTEER EXPERIENCES

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- 2021.04 – Present      **President**  
Society for Young Researchers in Neuroscience. Staff since April 2018.
- 2021.02 – Present      **Research Assistant**  
Sony Computer Science Laboratory. Supervised by Dr. Shinichi Furuya.
- 2018.12 – Present      **Engineer**  
Freelance. Experienced as neuro-engineer at Sandbox Inc. (2018.12–2021.04) and AI competition engineer at Probspace Inc.(2019.02 – 2019.07).
- 2017.07 – Present      **Translator**  
Freelance
- 2020.10 – 2021.03      **Paid Research Intern**  
International Research Center for Neurointelligence, University of Tokyo.  
Supervised by Dr. Tatsuya Daikoku.
- 2019.12 – 2020.06      **Writer**  
Techflyer Inc.
- 2018.02 – 2020.04      **Research Intern**  
NTT Communication Science Laboratories. Supervised by Dr. Makio Kashino.

## HONORS AND AWARDS

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2021	<b>SFC STUDENT AWARD</b> Keio University
2020	<b>Gold Prize</b> Online Conference, Keio SFC Academic Society
2020	<b>Excellent Graduation Project</b> Faculty of Environment and Information Studies, Keio University
2020	<b>Given “Likes” (9th place)</b> The 43rd Annual Meeting of the Japan Neuroscience Society
2019	<b>Student Paper Award (3rd Prize)</b> 2019 IEEE 1st Global Conference on Life Sciences and Technologies
2018	<b>Abe Research Award for Young Researchers (Nominated)</b> The 57th Annual Conference of Japanese Society for Medical and Biological Engineering

## PUBLICATIONS

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- Sakamoto, S.**, Kobayashi, A., Matsushita, K., Shimizu, R., & Aoyama, A. (2019) “Decoding Relative Pitch Imagery Using Functional Connectivity: An Electroencephalographic Study”, in *Proceedings of 2019 IEEE 1st Global Conference on Life Sciences and Technologies (LifeTech)*, vol. 1, pp. 48-49.
- Kawabata, M., Koyama, Y., **Sakamoto, S.**, Sato, M., Sato, Y., Takagi, S., Nagano, M., Misu, T., Yagi, S., & Yamashita, A. (2019). *2019 nenndo jigenn kenkyuukai jisshi hokoku noukagaku wakate no kai dai 11 kai gasshuku “Wakate Kenkyuusha Ni Muketa Recucha & Wa-kushoppu Gasshuku ~Shinkei Katsudou Ga Kinou Wo Umu Mekanizumu No Tankyuu, Riron No Jissenn to Ouyou~”* [Report on the 2019 Symposium, The 11th Symposium by Society for Young researchers on Neuroscience "Lecture & Workshop Symposium for Young Researchers: Exploring Function-related Neural Mechanisms and Practice and Application of its Theory]. *The Brain & Neural Networks.*, vol. 26 (3), pp. 105-109.
- Kobayashi, K., **Sakamoto, S.**, Sato, M., Sato, Y., Sugimoto, S., Nakata, T., Noyama, T., & Yamashita, A. (2021). *2021 nenndo jigenn kenkyuukai jisshi hokoku noukagaku wakate no kai dai 13 kai gasshuku “Wakate Kenkyuusha Ni Muketa Recucha & Wa-kushoppu Gasshuku ~Seitai Jouhou No Hikari Keisoku, Sousa Fijutu To Jinkou Chinou Ni Your Shinkei Mekanizumu No Rikai Oyobi Jissen~”* [Report on the 2021 Symposium, The 13th Symposium by Society for Young researchers on Neuroscience "Lecture & Workshop Symposium for Young Researchers: Understanding and Implementing the Neural Mechanisms by Optical Imaging and Artificial Intelligence]. *The Brain & Neural Networks.*, vol. 28 (2), pp. 103-108.

## CONFERENCE PRESENTATIONS AND OTHERS

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### TALKS

- Sakamoto, S.**, Matsushita, K., Kobayashi, A., Shimizu, R., & Aoyama, A. (2021). Oscillatory activity in multiple neural processes related to auditory imagery. Talk presented at *ICMPC16-ESCOM11 (International Conference on Music Perception and Cognition, European Society for the Cognitive Sciences of Music)*. Online.

- Sakamoto, S.** (2020). Oscillatory activity in multiple neural processes related to auditory imagery. Invited talk presented at Cognitive Developmental Robotics Lab, International Research Center for Neurointelligence, The University of Tokyo.
- Sakamoto, S.,** Kobayashi, A., Matsushita, K., Shimizu, R., & Aoyama, A. (2020). *Choukaku Souki No Shinkei Shori Ni Kannsuru Ritsudou No Kaiseki* [Oscillatory analysis related to neural processes of auditory imagery]. Talk presented at the the 29th Workshop on Multimodal Brain Information Technology, Japanese Society for Medical and Biological Engineering. Online.
- Sakamoto, S.** (2020). Neural Oscillations Related to Auditory Imagery and Neural Representations of Imaged Sound. Talk presented at the *Online Conference, Keio SFC Academic Society*. Online.
- Sakamoto, S.,** Kobayashi, A., Matsushita, K., Shimizu, R., & Aoyama, A. (2019). Decoding Relative Pitch Imagery Using Functional Connectivity: An Electroencephalographic Study. Talk presented at the *2019 IEEE 1st Global Conference on Life Sciences and Technologies*. Osaka, Japan.
- Watanabe, N., **Sakamoto, S.,** & Aoyama, A. (201). *Ketsugouon ni Chakumoku Shita Waon ni Kannsuru Noujouhoushori no Kentou* [Investigating Neural Processing of Chords Focusing on Combination Tones]. Talk presented at the 21st Application of Multimodal Neural Information Symposium in Japanese Society of Medical and Biological Engineering. Yokohama, Japan

## POSTERS

- Sakamoto, S.,** Matsushita, K., Kobayashi, A., Shimizu, R., & Aoyama, A. (2021). Neural Oscillation Related to Multiple Subprocesses in Auditory Imagery. Poster presented at *The 44th Annual Meeting of the Japan Neuroscience Society*. Kobe, Japan.
- Sakamoto, S.,** Aoyama, A. and Fujii, S. (2021). Uncertainty Resolution and Anticipation of Pleasure in Chord Progression: An EEG Study. Poster presented at *Neurosciences and Music VII*. Online.
- Sakamoto, S.,** Aoyama, A. and Fujii, S. (2020). Electroencephalographic Activity While Anticipating Uncertainty Resolution in Music. Poster presented at *The 43rd Annual Meeting of the Japan Neuroscience Society*. Online.
- Sakamoto, S.,** Kobayashi, A., Matsushita, K., Shimizu, R. and Aoyama, A. (2019). Classification of electroencephalographic oscillations during relative pitch imagery. *Society for Neuroscience, 2019*. Chicago, IL
- Sakamoto, S.,** Kobayashi, A., Matsushita, K., Shimizu, R., & Aoyama, A. (2019). Classification of Electroencephalogram during Pitch Imagery based on Relative Pitch Change. Poster presented at *The 58th Annual Conference of Japanese Society for Medical and Biological Engineering*. Okinawa, Japan.
- Sakamoto, S.,** Matsushita, K., Kobayashi, A., Shimizu, R., & Aoyama, A. (2018). Classification of EEG data during imagery of higher and lower pitched sounds. Poster presented at *The 41st Annual Meeting of the Japan Neuroscience Society*. Kobe, Japan.
- Kobayashi, A., **Sakamoto, S.,** Matsushita, K., Shimizu, R., & Aoyama, A. (2018). Classification of EEG data during imaging higher and lower pitched sounds using machine learning. Poster Presented at *The 57th Annual Conference of Japanese Society for Medical and Biological Engineering*. Sapporo, Japan. (Presenter)

## GRANTS

**Total: 2344,300 JPY, roughly 20,500 USD / 15,500 GBP / 26,500 CAD**

### *AS A PERSONAL RESEARCHER*

Total: 894,300 JPY

Taikichiro Mori Memorial Research Grants. “*Ongaku Choushu no Kitai ni Kansuru Shinkei Ritsudou to Sono Jikan Hendou* [Neural oscillations and temporal dynamics related to expectation during musical listening]”. 210,000 JPY. 2021.

Keio SFC Eccentric Research Program. “*Kandou suru Ongaku no Himitsu: ‘muzu-muzu kan’ no kaiketsuni kannsuru nouha seibunn* [The secret of pleasurable music: neural components related to the resolution of ‘tingle’]”. 150,000 JPY. 2021.

Yamagishi Student Project Support Program. “*Soukion no Picchi ni tokuiteki na Shinkei Katsudou no Doutei oyobi Tokutei* [Specification of neural activity related to pitch of imaged sound]”. 150,000 JPY. 2020.

Incentive to Study and Conduct Research Through SFC Education Promotion Foundation. “*Soukion no Soutaiteki Picchi Henka ni Tokuiteki na Shinkei Ritsudou no Doutei to Sono Shikibetu* [Identification and classification of neural oscillations specific to relative pitch change of imaged sound]” 210,000 JPY. 2019.

Incentive to Study and Conduct Research Through SFC Education Promotion Foundation. “*Seiri Shihyou, Noukinou Keisoku wo Mochiita Ongaku no Raudonesu to Namidakann no Kankei no Kaimei* [Revealing the relationship between musical loudness and feeling of tears using psychophysiological measures and neural measurement]”. 160,000 JPY. 2018.

Keio SFC Academic Society. “*Dai 57 kai Nihon Seitai Ikou Gakkai Taikai ni Okeru ‘Kikai Gakushuu wo Mochiita Kouonn, Teionn Soukiji no Nouha Deta no Bunrui’ no Kenkyuu Happyo* [Presentation of ‘Classification of EEG data during high- and low-pitch imagery using machine learning’ at the 57th Annual Conference of Japanese Society of Medical and Biological Engineering]” 14,300 JPY. 2018.

### *AS THE PRESIDENT/STAFF OF SOCIETY FOR YOUNG RESEARCHERS IN NEUROSCIENCE*

Total: 1450,000 JPY

Junior Symposium Grant, Japanese Neural Network Society. “*Wakate Kenkyuusha Ni Muketa Recucha & Wa-kushoppu Gasshuku ~Seitai Jouhou No Hikari Keisoku, Sousa Fijutu To Jinkou Chinou Ni Your Shinkei Mekanizumu No Rikai Oyobi Jissen~* [Lecture & Workshop Symposium for Young Researchers: Understanding and Implementing the Neural Mechanisms by Optical Imaging and Artificial Intelligence]” 250, 000 JPY. 2021.

Junior Symposium Grant, Japanese Neural Network Society. “*Wakate Kenkyuusha Ni Muketa Recucha & Wa-kushoppu Gasshuku ~Jikkenn to Rironn ni your Gakushuu no Mekanizumu no Tansaku oyobi Tabunnya tonou Kyoudou Kenkyuu no Keikaku Enshuu~* [Lecture & Workshop Symposium for Young Researchers: Exploring the Neural Mechanisms of Learning through Experiments and Theory, Workshop of Collaboration Research Planning]” 200, 000 JPY. 2020.

Junior Symposium Grant, Japanese Neural Network Society. “*Wakate Kenkyuusha Ni Muketa Recucha & Wa-kushoppu Gasshuku ~Shinkei Katsudou Ga Kinou Wo Umu Mekanizumu No Tankyuu, Rironn No Jissenn to Ouyou~* [Lecture & Workshop Symposium for Young Researchers: Exploring Function-related Neural Mechanisms and Practice and Application of its Theory]” 200, 000 JPY. 2019.

Symposium Grants, Kato Memorial Bioscience Foundation. “*Dai 14 kai Nou Kagaku Wakate No Kai Gasshuku* [14th Workshop Camp of Society for Young Researchers in Neuroscience]”. 300,000 JPY. 2021.

Symposium Grants, Kato Memorial Bioscience Foundation. “*Dai 13 kai Nou Kagaku Wakate No Kai Gasshuku* [13rd Workshop Camp of Society for Young Researchers in Neuroscience]”. 200,000 JPY. 2020.

Symposium Grants, Kato Memorial Bioscience Foundation. “*Dai 12 kai Nou Kagaku Wakate No Kai Gasshuku* [12nd Workshop Camp of Society for Young Researchers in Neuroscience]”. 300,000 JPY. 2019.

## TEACHING EXPERIENCE

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### *INSTRUCTOR OF RECORD*

2017.07 – 2020.02	<b>Private Tutor of High School Math</b>
2018.02 – 2020.02	<b>Private Tutor of Junior High School Math and Physics</b>
2019.10 – 2020.01	<b>Private Tutor of College Math</b>
2020.02 – 2020.06	<b>Private Tutor of Junior High School Math and Physics</b>

### *TEACHING ASSISTANTSHIPS*

2020.09 – 2021.02	<b>Evolution of Music</b> , Keio University (Patrick E. Savage, Ph.D.)
2020.09 – 2021.02	<b>History of Music</b> , Keio University (Patrick E. Savage, Ph.D.)
2018.04 – 2021.07	<b>Calculus</b> , Keio University (Atushi Aoyama, Ph.D.)
2021.04 – 2021.07	<b>Neural Information Science</b> , Keio University (Atsushi Aoyama, Ph.D.)
2019.09 – 2020.02	<b>Neural Information Science</b> , Keio University (Atsushi Aoyama, Ph.D.)
2020.04 – 2020.07	<b>Music and Brain</b> , Keio University (Shinya Fujii, Ph.D.)
2020.04 – 2020.07	<b>Knowledge Processing and Discovery</b> , Keio University (Yasushi Kiyoki, Ph.D. and Atsushi Aoyama, Ph.D.)
2020.04 – 2020.07	<b>Sing</b> , Keio University (Yoichi Kitayama)

## SKILLS

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### *LANGUAGE*

<b>Japanese</b>	Native
<b>English</b>	Fluent. TOEFL iBT 111. TOEIC 990, EIKEN Grade1. Graduated from Phillips Academy, a boarding school in Massachusetts.

### *PROGRAMMING*

<b>Proficient</b>	Matlab, Python, Git, LaTeX, UNIX
<b>Basic</b>	C, R, Mathematica, Haskell, HTML, Javascript, CSS

## TRAINING EXPERIENCE

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2021.08	<b>fMRI Training Workshop Camp</b> National Institute of Physiological Sciences
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2019.09	<b>Free Energy Principle Workshop Camp</b> National Institute of Physiological Sciences
2017.09 – 2018.07	<b>Brain Science Training Program</b> RIKEN Center for Brain Science
2018.02 – 2018.04	<b>NICO2AI School</b> Dwango AI Lab.