

César D. Salvador, Ph.D.

Acoustic Information Sciences

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Date of birth: 9 March 1978.

Nationality: Peruvian.

Resume

My research interests include spatial hearing and its integration with other modes of perception such as vision and touch. I received the M.Sc. and Ph.D. degrees in 2013 and 2016, respectively, both from the Graduate School of Information Sciences (GSIS), Tohoku University, Sendai, Japan. From April 2017 to March 2019, I worked as an Assistant Professor at the Research Institute of Electrical Communication (RIEC), Tohoku University. From August 2019 to January 2021, I worked as Chief Audio Scientist for Silicon Integrated Co. Ltd., Wuhan, China. In August 2019, I founded Perception Research in Lima, Peru, to foster education and research on spatial acoustics in the context of multisensory perception, artificial intelligence, and immersive technology.

Education

2016 **Ph.D., Information Sciences**, *Tohoku University*, Sendai, Japan.

2013 **M.Sc., Information Sciences**, *Tohoku University*, Sendai, Japan.

2005 **B.Sc., Electrical Engineering**, *Pontifical Catholic University of Peru*, Lima, Peru.

Professional Experience

2021–Present **Founder**, *Perception Research*, Lima, Peru.

- The Perception team conducts research on spatial acoustics and promotes academy-industry cooperation through international collaborations. We also foster the growth of the Spanish-speaking acoustic research community through training and publishing.

2019–2021 **Chief Audio Scientist**, *Silicon Integrated Co., Ltd.*, Wuhan, Hubei, China.

- The audio algorithm development team of Silicon Integrated (SI) in China and Peru creates smart 3D audio solutions for mobile platforms considering immersive user experiences through multisensory interfaces.

2017–2019 **Assistant Professor (Specially Appointed for Research)**, *Advanced Acoustic Information Systems Laboratory, RIEC, Tohoku University*.

- Principal Investigator of the project “Perceptual Constancy in Spatial Hearing,” supported by a Grant-in-Aid of the Japan Society for the Promotion of Science (JSPS), under Grant JP17K12708 (2017–2018).
Report available at: <https://kaken.nii.ac.jp/grant/KAKENHI-PROJECT-17K12708>.
- In charge of the international collaboration with Technical University of Dresden and the University of Oldenburg, both in Germany.

2016–2017 **Postdoctoral Researcher**, *Advanced Acoustic Information Systems Laboratory, RIEC, Tohoku University*.

- Formulation of physically-motivated array signal processing methods for high-definition spatial sound systems. Part of these works was a sequel to my doctoral thesis. Results were published in three journal papers.
- Tutoring of undergraduate and graduate students, and teaching of short courses.

- 2008–2010 **“Docente Investigador”, equivalent to Assistant Professor (Research)**, *Faculty of Communication Sciences, University of San Martin de Porres, Lima, Peru.*
- Principal Investigator of the project “Auralization: Towards the authentic representation of sound in space.” In this project, spatial sound technologies were applied to the recording, preservation, and reproduction of urban and rural soundscapes of Lima. The results were exhibited annually in the sound art festival “Lima Sonora”, and published in four international proceedings.
- 2006–2007 **Academic Coordinator**, *National Institute for Research and Training in Telecommunications (INICTEL)*, Lima, Peru.
- Planning and coordination of workshops in robotics. The workshops were oriented to students of the Army Technical School of Peru and were lectured by INICTEL’s academic staff.
- 2006–2010 **Teaching Assistant**, *Department of Sciences and Engineering, Pontifical Catholic University of Peru, Lima, Peru.*
- Laboratory sessions of undergraduate lectures within the specialties of telecommunications and electrical engineering: Communication theory (IEE253, TEL208), Digital signal processing (IEE210, IEE352, TEL233), Microwaves (TEL236), Antenna engineering (TEL345), Computer architecture (IEE208), and Calculus (MAT119).

Awards and Scholarships

- 2016 **Best Paper Award**, *11th International Conference on Intelligent Information Hiding and Multimedia Signal Processing*, for co-authoring the paper entitled “A compact representation of the head-related transfer function inspired by the wavelet transform on the sphere”.
- 2011–2016 **Scholarship**, *Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT or Monbukagakusho)*, to pursue studies in Graduate School of Information Sciences (GSIS), Tohoku University, Sendai, Japan.
- 2008 **Scholarship**, *Indian Technical and Economic Cooperation (ITEC)*, to attend a two-months training course on Remote Sensing and Geographical Information Systems at the Indian Institute of Remote Sensing (IIRS), Dehradun, India.
- 2007 **Honorable Mention**, *UNESCO and Daimler Mondialogo Engineering Award*, for co-authoring a project focused on improving the diagnosis and treatment of tuberculosis and cutaneous Leishmaniasis in Peru using medical imaging techniques, in collaboration with graduate students of the University of Rochester and undergraduate students of the Pontifical Catholic University of Peru.

Research Funding

- 2017–2018 **Grant-in-Aid for Young Scientists (B)**, *Japan Society for the Promotion of Science (JSPS)*, for the project “Perceptual Constancy in Spatial Hearing”, JSPS Grant JP17K12708.
Report available at: <https://kaken.nii.ac.jp/grant/KAKENHI-PROJECT-17K12708>
- 2018 **Travel Grant**, *European Project Center (EPC), and Institute of Acoustics and Speech Communications (IAS), TU Dresden*, to enable participation in the workshop on the MSC Individual Fellowships Program, with the project “High-definition Acoustic Reconstruction for Multisensory Environments”, Dresden, Germany, June 2018.
- 2016 **Travel Grant**, *Murata Science Foundation*, to present the paper “Numerical evaluation of binaural synthesis from rigid spherical microphone array recordings” at the Audio Engineering Society International Conference on Headphone Technology, held in Aalborg, Denmark, from Aug. 24th to Aug. 26th, 2016.

Journal Papers

1. J. Shi, C. D. Salvador, J. Treviño, S. Sakamoto, and Y. Suzuki, “Spherical harmonic representation of rectangular domain sound fields,” *Acoust. Sci. Technol.*, vol. 41, no. 1, pp. 451–453, Jan. 2020.
Available at <https://doi.org/10.1250/ast.41.451>
2. S. Hu, J. Treviño, C. D. Salvador, S. Sakamoto, and Y. Suzuki, “Modeling head-related transfer functions with spherical wavelets,” *Appl. Acoust.*, vol. 146, pp. 81–88, Mar. 2019.
Available at <https://doi.org/10.1016/j.apacoust.2018.10.026>
3. C. D. Salvador, S. Sakamoto, J. Treviño, and Y. Suzuki, “Boundary matching filters for spherical microphone and loudspeaker arrays,” *IEEE/ACM Trans. Audio, Speech, Language Process.*, vol. 26, no. 3, 461–474, March 2018.
Available at <https://doi.org/10.1109/TASLP.2017.2778562>
4. C. D. Salvador, S. Sakamoto, J. Treviño, and Y. Suzuki, “Enhancement of spatial sound recordings by adding virtual microphones to spherical microphone arrays,” *J. Inf. Hiding and Multimedia. Signal Process.*, vol. 8, no. 6, pp. 1392–1404, Nov. 2017.
Available at <http://bit.kuas.edu.tw/~jihmsp/2017/vol8/JIH-MSP-2017-06-020.pdf>
5. C. D. Salvador, S. Sakamoto, J. Treviño, and Y. Suzuki, “Design theory for binaural synthesis: Combining microphone array recordings and head-related transfer function datasets,” *Acoust. Sci. Technol.*, vol. 38, no. 2, pp. 51–62, Mar. 2017.
Available at <https://doi.org/10.1250/ast.38.51>
6. C. D. Salvador, S. Sakamoto, J. Treviño, and Y. Suzuki, “Spatial accuracy of binaural synthesis from rigid spherical microphone array recordings,” *Acoust. Sci. Technol.*, vol. 38, no. 1, pp. 23–30, Jan. 2017.
Available at <https://doi.org/10.1250/ast.38.23>
7. C. D. Salvador, S. Sakamoto, J. Treviño, and Y. Suzuki, “Distance-varying filters to synthesize head-related transfer functions in the horizontal plane from circular boundary values,” *Acoust. Sci. Technol.*, vol. 38, no. 1, pp. 1–13, Jan. 2017.
Available at <https://doi.org/10.1250/ast.38.1>
8. S. Hu, J. Treviño, C. D. Salvador, S. Sakamoto, J. Li, and Y. Suzuki, “A local representation of the head-related transfer function,” *J. Acoust. Soc. Am.*, vol. 140, no. 3, pp. EL285–EL290, Sept. 2016.
Available at <https://doi.org/10.1121/1.4962805>

Patents

1. Y. Suzuki, S. Sakamoto, J. Treviño, C. D. Salvador, and T. Kudo, “Method, program, and device for stereophonic sound reproduction,” Japanese Patent Application No. 2016-202494, Oct. 2016.

Professional Affiliations

- Member **Institute of Electrical and Electronics Engineers (IEEE), IEEE Signal Processing Society.**
- Member **Audio Engineering Society (AES).**
- Member **Acoustical Society of Japan (ASJ).**
- Member **American Mathematical Society (AMS).**

Academic Service

- Reviewer **IEEE/ACM Transactions on Audio, Speech, and Language Processing.**
Reviewer **IEEE Access.**
Reviewer **The Journal of the Acoustical Society of America.**
Reviewer **Audio Engineering Society.**
Reviewer **Applied Acoustics.**
Reviewer **Acoustics Australia.**
Reviewer **Journal of Information Hiding and Multimedia Signal Processing.**
Reviewer **2021 IEEE INTERCON.**
Reviewer **2021 IEEE EIRCON.**

Administration

- 2019 **Organizer**, *Spatial Acoustics and Hearing Research Week (in Spanish)*, held at Universidad de San Martín de Porres and Centro Fundación Telefónica, from January 28 to February 3, 2019.
Report available at: <https://cesardsalvador.github.io/a3d/>
- 2018 **Organizer**, *Exchange Meetings on Spatial Sound, Speech, and Haptic Signal Processing between the Technische Universität Dresden (TU Dresden) and Tohoku University*, held at the Institute of Acoustics and Speech Communication, TU Dresden, Germany, from January 30 to February 2, 2018.
- 2018 **Organizer**, *Exchange Meeting on Spatial Sound and Speech Signal Processing between the Carl von Ossietzky University of Oldenburg and Tohoku University*, held at the Research Group on Auditory Signal Processing for Hearing Devices of the Carl von Ossietzky University of Oldenburg, Germany, on January 29, 2018.
- 2017, 2018 **Collaborator**, *Open Campus of Tohoku University, and Open Campus of RIEC*, in charge of the exhibitions of the the Acoustic Information Systems Laboratory, held in July and October.

Languages

- Spanish · Mother tongue
- English · Fluent
- Japanese · Advanced
- French · Advanced

References

References available upon request.