Teruki TOYA, Ph.D.

Contact

Address: Room #K425, Building #A3, Kofu-east campus, 4-3-11 Takeda, Kofu, 400-8511 Japan
Email: t.toya@yamanashi.ac.jp Tel: +81 55-220-8630
Website: https://www.ccn.yamanashi.ac.jp/~t.toya/

Current Position

- **Project Assistant Professor** @Department of Computer Science and Engineering, Faculty of Engineering, University of Yamanashi

Work Experience

Apr. 2023 – Current	**Project Assistant Professor**, Department of Computer Science and Engineering, Faculty of Engineering, University of Yamanashi
Jan. 2022 – Mar. 2023	**Post-doctoral researcher**, Faculty of Frontier Engineering, Institute of Science and Engineering, Kanazawa University (Project: Development of diagnostic system for conductive hearing impairment, represented by Prof. Michio MURAKOSHI)
Apr. 2021 – Dec. 2021	**Post-doctoral researcher**, Japan Advanced Institute of Science and Technology (Project: "Toward enrichment of speech communication" represented by Prof. Masashi UNOKI)
Mar. 2021 – Dec. 2021	**Japan Sales Consultant**, Magic Data Technology Co., Ltd.
Apr. 2017 – Mar. 2020	**Research Fellow (DC1)**, Japan Society for the Promotion of Science (JSPS) (Project: "Study on auditory feedback mechanism for speech production based on bone-conduction hearing" represented by Teruki TOYA)

Educational History

Oct. 2016 – Mar. 2021	Doctoral Program, Graduate School of Advanced Science and Technology, Japan Advanced Institute of Science and Technology, **Ph.D. in Information Science**
Oct. 2017 – Jan. 2018 & Sep. 2018 – Oct. 2018	**Visiting Research Student**, Institute of Acoustics and Speech Communication, Technical University of Dresden (Technische Universität Dresden), Germany (Project: "Transmission properties and acoustical characteristics of speakers' own voice via bone conduction" supervised by Jun.-Prof. Dr.-Ing. Peter BIRKHOLZ)

Apr. 2014 – Sep. 2016	Master's Program, School of Information Science, Japan Advanced Institute of Science and Technology, **M.S. in Information Science**
Apr. 2010 – Mar. 2014	Department of Informatics and Engineering, University of Electro-Communications, **B.S. in Engineering**

Research Topics

- **Transmission mechanism of speakers' own voice through bone-conduction and its role for auditory feedback during speaking**
- **Non-invasive methods for diagnosis of conductive hearing impairment**
- Improvement of speech intelligibility for bone-conduction devices
- Auditory impression of speakers' own voice
- Experimental study on suppressive masking based on psychophysical tuning curve

[Research interests: psychoacoustics, speech production/perception, acoustical signal processing, audiology, auditory physiology]

Competitive Funds

Apr. 2023 – Mar. 2024	**Project for deploying research outcomes for medical devices**, Japan Agency for Medical Research and Development (AMED), Member, 1,540,500 JPY
Apr. 2021 – Mar. 2024	**Grant-in-Aid for Research Activity Start-up** (No. 21K21314), Japan Society of the Promotion of Science (JSPS), Representative, 3,120,000 JPY
Apr. 2017 – Mar. 2020	**Grant-in-Aid for JSPS Fellows** (No. 17J03679), Japan Society of the Promotion of Science (JSPS), Representative, 2,500,000 JPY

Teaching Experience

Apr. 2023 – Current	Project Assistant Professor, University of Yamanashi [Practical lecture] **Hardware – Basic (in Japanese)** [Practical lecture] **Software Design Project (in Japanese)**
Oct. 2016 – Jun. 2020	Teaching Assistant, Japan Advanced Institute of Science and Technology [Lecture] **Statistical Signal Processing (in Japanese)** [Lecture] **Human Perceptual Systems and its Models (in English)**
Apr. 2015 – Mar. 2019	Visiting lecturer, Ishikawa Technical Senior High School (Lecture: "Advanced Science and Technology" for the Super Professional Highschool Project)

Computer Skills

- Programming: **Python**, **MATLAB**, R, C
- Others: **LaTeX**, Microsoft Office (Word, Excel, PowerPoint), HTML

Languages

- Japanese (native)
- English

Publications

Journal Papers

1. T. Toya, M. Kobayashi, K. Nakamura and M. Unoki, “Methods for improving word intelligibility of bone-conducted speech by using bone-conduction headphones,” Applied Acoustics, Vol. 207, No. 109337, pp. 1-12, 2023.
2. T. Toya, P. Birkholz and M. Unoki, “Measurements of transmission characteristics related to bone-conducted speech using a sound source in the oral cavity,” Journal of Speech, Language and Hearing Research, Vol. 63, No. 12, pp. 4252-4264, 2020.
3. T. Toya, D. Ishikawa, R. Miyauchi, K. Nishimoto and M. Unoki, “Study on effects of speech production during delayed auditory feedback for air-conducted and bone-conducted speech,” Journal of Signal Processing, Vol. 20, No. 6, pp. 197-200, 2016.

Book Chapter

4. T. Toya, P. Birkholz and M. Unoki, “Estimates of transmission characteristics related to perception of bone-conducted speech using real utterances and transcutaneous vibration on larynx,” in A. A. Salah, A. Karpov and R. Potapova (Eds.), Speech and Computer, LNAI 11658, pp. 491-500, Springer Nature Switzerland, AG, Cham, Switzerland, 2019.

Peer-Reviewed International Conference Proceedings

5. Y. Uezu, S. Wang, T. Toya and M. Unoki, "Consonant-emphasis method incorporating robust consonant-section detection to improve intelligibility of bone-conducted speech," Proc. INTERSPEECH 2023, pp. 849-853, Mon-P5.16, Dublin, Ireland, Aug. 2023.
6. T. Toya, M. Kobayashi, K. Nakamura and M. Unoki, “Method for improving the word intelligibility of presented speech using bone-conduction headphones,” Proc. INTERSPEECH 2022, pp. 759-763, Mon-P-OS-2-1, Incheon, Korea, Sep. 2022.

Non-Reviewed International Conference Proceedings

7. T. Toya, H. Nakagawa, R. Nagai, H. Sugimoto and M. Murakoshi, “Sweep frequency impedance (SFI) measures of middle ears with ossicular-chain dysfunctions,” Proc. 6th Japan-Switzerland Workshop on Biomechanics (JSB2023), Session 5-5, 1p, Otaru, Japan, Aug. 2023.
8. S. Inoue, T. Toya, Y. Uezu and M. Unoki, “Study on suppression effect of air-conducted sound by bone-conducted sound,” Proc. Inter-noise 2023, 1-1-3, 11p, Makuhari, Japan, Aug. 2023.

9. T. Toya, P. Birkholz and M. Unoki, “Subjective evaluation regarding mixing ratio of bone-conducted to air-conducted speech for own-voice perception,” Proc. 24th International Congress for Acoustics (ICA 2022), pp. 160-167, Gyeongju, Korea, Oct. 2022.
10. S. Morita, D. Kawamoto and T. Toya, “Voice conversion model for estimation of transfer characteristic in auditory feedback,” Proc. 23rd International Congress for Acoustics (ICA 2019), pp. 6630-6636, Aachen, Germany, Sep. 2019.
11. T. Toya, P. Birkholz and M. Unoki, “Analysis of spectral and transmission characteristics of bone-conducted speech using real utterances and transcutaneous vibration,” Proc. 176th Meeting of Acoustical Society of America, Vol. 144, No. 3, p.1838, Victoria, Canada, Nov. 2018.
12. T. Toya and M. Unoki, “Presentation method as air- and bone-conducted speech for delayed auditory feedback,” Proc. Acoustics'17 (ASA & EAA), Vol. 141, No. 5, p. 3820, Boston, US, Jun. 2017.

■ **Domestic Workshops & Meetings**

13. T. Toya, R. Nagai, H. Sugimoto and M. Murakoshi, “Improvement of middle-ear impedance meter based on principles of impulse response measurement,” Proc. 150th (2023 Autumn) Meeting of Acoust. Soc. Jpn., pp. 877-878, 1-R-12, Nagoya, Sep. 2023 (in Japanese).
14. S, Ariizumi, T. Toya and K. Ozawa, “Consideration on Sound Source Distance Measurement by Complex Sparse Bayesian Estimation Using a Small Microphone Array System,” IEICE Technical Report, Vol. 123, No. 95, EA2023-17, pp.72-77, Sapporo, Jul. 2023 (in Japanese).
15. X. Su, W. Kong, X. Jin, T. Toya and K. Ozawa, “An idea about pretraining in EEG domain,” IEICE Technical Report, Vol. 123, No. 95, EA2023-15, pp.58-63, Sapporo, Jul. 2023.
16. S. Ariizumi, T. Toya and K. Ozawa, “A study on source distance measurement using small microphone arrays based on complex sparse bayesian estimation,” IPSJ SIG Technical Report, Vol. 2023-MUS-137, No. 19, pp. 1-6, Chofu, Jun. 2023 (in Japanese).
17. T. Toya, H. Nakagawa, R. Nagai, H. Sugimoto and M. Murakoshi, “Middle-ear dynamic characteristics for ossicular-chain separation/fixation based on sweep frequency impedance (SFI),” 34th Conference on Bioengineering, P313-2, Sendai, Jun. 2023 (in Japanese).
18. H. Nakagawa, T. Toya, R. Nagai, H. Sugimoto and M. Murakoshi, “Sweep frequemcy impedance (SFI) measures for normal ears,” 34th Conference on Bioengineering, P312-2, Sendai, Jun. 2023 (in Japanese).
19. S. Inoue, T. Toya, Y. Uezu and M. Unoki, “Study on the suppression effect of the air-conducted tone by the bone-conducted tone,” Proc. 149th (2023 Spring) Meeting of Acoust. Soc. Jpn., 1-4P-5, 479-482, Online, Mar. 2023 (in Japanese).
20. Y. Watanabe, S. Tamai, T. Toya, R. Nagai, W. Takei, H. Sugimoto and M. Murakoshi, “理工系研究シーズの医療機器開発の促進事例；新規の中耳機能測定技術,” 14th Meeting on JSCTR, Kanazawa, Feb. 2023 (in Japanese).
21. T. Kokubo, H. Nakagawa, T. Toya and M. Murakoshi, “Development of a new ear probe for sweep frequency impedance (SFI) meter,” Proc. 33th Conference on Bio-frontier, 1C18, 4p, Kobe, Dec. 2022 (in Japanese).

22. T. Toya, A. Mageshi, H. Nakagawa, R. Nagai, H. Sugimoto and M. Murakoshi, “Measurement of dynamic characteristics for several middle-ear conditions based on sweep frequency impedance (SFI),” Proc. 33th Conference on Bio-frontier, 1C08, 4p, Kobe, Dec. 2022 (in Japanese).
23. S. Wang, Y. Uezu, T. Toya and M. Unoki, "Improvement of consonant emphasis method for bone-conduction speech intelligibility," IEICE Technical Report, Vol. 122, EA2022-59, pp. 93-98, Online, Nov. 2022 (in Japanese).
24. T. Toya, M. Kobayashi, K. Nakamura and M, Unoki, “Methods for improving word intelligibility of bone-conducted speech presented by bone-conduction headphones,” Proc. 2022 Autumn Meeting of the Institute of Noise Control Engineering of Japan, 1-1-07, 4p, Tokyo, Nov. 2022 (in Japanese).
25. S. Morita, T. Toya and M. Unoki, “Study on timbre and pitch differences in self-perceived own voices,” Proc. 2022 Autumn Meeting of Acoust. Soc. Jpn., 3-P-25, 4p, Sapporo, Sep. 2022 (in Japanese).
26. W. Zhu, T. Toya, K. Nakamura and M, Unoki, “Improvement of word intelligibility of bone-conducted speech by consonant emphasis,” Proc. 2022 Spring Meeting of Acoust. Soc. Jpn., 2-4-6, pp. 693-696, Online, Mar. 2022 (in Japanese).
27. T. Toya, M. Kobayashi, K. Nakamura and M, Unoki, “Methods for improving word intelligibility of bone-conducted speech presented by bone-conduction hearing devices,” Proc. 2022 Spring Meeting of Acoust. Soc. Jpn., 2-4-5, pp. 689-692, Online, Mar. 2022 (in Japanese).
28. W. Zhu, S. Fujita, T. Toya, M. Kobayashi and M. Unoki, “Study on method for improving speech intelligibility for bone-conduction hearing devices,” Proc. Auditory Res. Meeting, Vol. 51, No. 7, H-2021-91, pp. 491-496, Online, Nov. 2021 (in Japanese).
29. T. Toya, P. Birkholz and M. Unoki, “Investigation of sidetone attenuation for measurements of bone-conduction transmission characteristics during vocalization,” Proc. 2021 Autumn Meeting of Acoust. Soc. Jpn., 1-4-3, pp. 695-696, Online, Sep. 2021 (in Japanese).
30. T. Toya, P. Birkholz and M. Unoki, “Measurements of transmission characteristics related to bone-conducted speech under attenuation of sidetones with a soundproof wall,” Proc. Auditory Res. Meeting, Vol. 51, No. 2, H-2021-10, pp. 55-60, Online, May 2021 (in Japanese).
31. S. Morita, T. Toya and M. Unoki, “Investigation of speaker individuality for sense of self-perceived own voices,” Proc. 2021 Spring Meeting of Acoust. Soc. Jpn., 3-4P-3, pp. 705-708, Online, Mar. 2021 (in Japanese).
32. T. Toya, P. Birkholz and M. Unoki, “Subjective evaluation for mixing ration of bone-conducted to air-conducted speech in own-voice perception,” Proc. Auditory Res. Meeting, Vol. 50, No. 3, H-2020-29, pp. 153-158, Online, Jun. 2020 (in Japanese).
33. T. Toya, P. Birkholz and M. Unoki, “Proportion of bone-conducted speech transmission in one's perceived own voice,” Proc. 2020 Spring Meeting of Acoust. Soc. Jpn., 1-P-4, pp. 799-800, Saitama, Mar. 2020 (in Japanese).
34. S. Morita, D. Kawamoto and T. Toya, “Voice conversion model besed on air-conducted and bone-conducted voices,” Proc. 2019 Autumn Meeting of Acoust. Soc. Jpn., 1-R-9, pp. 597-600, Shiga, Sep. 2019 (in Japanese).

35. T. Toya, P. Birkholz and M. Unoki, “Estimates of ear-canal radiation characteristics for bone-conducted speech,” Proc. 2019 Autumn Meeting of Acoust. Soc. Jpn., 1-R-8, pp. 595-596, Shiga, Sep. 2019 (in Japanese).
36. S. Morita, D. Kawamoto and T. Toya, “Study of voice conversion model using air- and bone-conducted sound in auditory feedback,” Proc. Auditory Res. Meeting, Vol. 49, No. 5, H-2019-59, pp. 301-305, Miyagi, Aug. 2019 (in Japanese).
37. T. Toya, P. Birkholz and M. Unoki, “Analysis of transmission characteristics of bone-conducted speech derived from sound pressure in vocal tract,” Proc. Auditory Res. Meeting, Vol. 49, No. 2, H-2019-19, pp. 95-100, Tokyo, May 2019 (In Japanese).
38. T. Toya, P. Birkholz and M. Unoki, “Analysis of transmission characteristics of bone-conducted speech using a sound source in oral cavity,” Proc. 2019 Spring Meeting of Acoust. Soc. Jpn., 1-R-20, pp. 835-836, Tokyo, Mar. 2019 (in Japanese).
39. T. Toya, P. Birkholz and M. Unoki, “Analysis of transmission characteristics of bone-conducted speech using spoken voice,” IEICE Technical Report, Vol. 117, No. 515, EA2017-167, pp.355-360, Ishigaki-isl., Mar. 2018 (in Japanese).
40. T. Toya, P. Birkholz and M. Unoki, “Analysis of transmission characteristics of bone-conducted speech using long-term average spectrum,” Proc. 2018 Spring Meeting of Acoust. Soc. Jpn., 3-P-5, pp. 1297-1300, Saitama, Mar. 2018 (in Japanese).
41. T. Toya, P. Birkholz and M. Unoki, “Analysis of transmission characteristics of bone-conducted speech using vibration signals,” Proc. Auditory Res. Meeting, Vol. 48, No. 2, H-2018-34, pp.169-174, Okinawa, Mar. 2018 (in Japanese).
42. T. Toya and M. Unoki, “Study on acoustical characteristics of bone-conducted speech perceived by speakers,” Proc. 2017 Autumn Meeting of Acoust. Soc. Jpn., 3-P-10, pp. 345-348, Ehime, Sep. 2017 (in Japanese).
43. T. Toya and M. Unoki, “Presentation method for delayed auditory feedback by air-conducted and bone-conducted speech,” Proc. 2017 Spring Meeting of Acoust. Soc. Jpn., 3-Q-46, pp. 1529-1532, Kanagawa, Mar. 2017 (in Japanese).
44. T. Toya and M. Unoki. “Study on effects of delayed auditory feedback by air-conducted and bone-conducted speech on speech production,” IEICE Technical Report, Vol. 116, No. 246, EA2016-34, pp. 19-24, Ishikawa, Oct. 2016 (in Japanese).
45. T. Toya, T. Fukunari and K. Nishimoto, “Notes-nugetter: A collective and irreversible musical composition system based on Twitter,” Proc. Interaction 2015, B09, pp. 470-472, Tokyo, Mar. 2015 (in Japanese).

Awards

- **Student-Research Encouraging Prize**, Workshop for Electroacoustics, Acoustical Society of Japan, Oct. 2016.
- **NCSP'16 Student Paper Award**, Research Instutute of Signal Processing, Mar. 2016.
- **Best Student Award**, Hokuriku Branch, The Institute of Electronics, Information and Communication Engineers, Mar. 2016.

- **Best Paper & Presentation Award**, Hokuriku Branch, Acoustical Society of Japan, Nov. 2015.

Misc.

Dec. 2022	**Research talk** @Center for Frontier Medical Engineering, Chiba University,
Jun. 2021	**Research talk** @Human Information Science Laboratory, NTT Communication Science Laboratories
Sep. 2018	**Research talk** @Beginners' Seminar in 2018 Autumn Meeting of Acoustical Society of Japan, Students and Young Researchers Forum united with Acoustical Society of Japan
Mar. 2017 – Mar. 2023	**Organizing staff**, **Students and Young Researchers Forum** united with Acoustical Society of Japan