

Can Nerse

CONTACT INFORMATION

University of Technology Sydney
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APPOINTMENTS

Research Fellow, 2023 – 2025
School of Mechanical and Mechatronic Engineering,
University of Technology Sydney, NSW, Australia

Postdoctoral Research Associate, 2021 – 2023
Host: Sebastian Oberst
Centre for Audio, Acoustics and Vibration (CAAV),
and Biogenic Dynamics Laboratory
University of Technology Sydney, NSW, Australia

Postdoctoral Research Associate, 2020
Host: Semyung Wang
School of Mechanical Engineering
and Intelligent System Design Laboratory
Gwangju Institute of Science and Technology, Gwangju, South Korea

EDUCATION

Gwangju Institute of Science and Technology, Gwangju, South Korea
Ph.D., Mechanical Engineering, 2020
Thesis: “A study of complex modes in nonuniformly damped systems with wave-based framework”
MSc., Mechatronics, 2015
Thesis: “Analysis and design of multi-layer cylindrical shells for noise and vibration control”
Advisor: Semyung Wang

Middle East Technical University, Ankara, Türkiye
BSc., Mechanical Engineering, *Magna cum laude*, 2013

PREPRINTS

1. Zourab Brodzeli, **Can Nerse**, Benjamin Halkon, John Canning, and Sebastian Oberst. Optically interrogated liquid crystal-based, charge-mode accelerometer telemetry. *Under review*, 2025
2. Maria Rosaria Tucci, Abhishek Ray Mohapatra, Ivan Sili, David Navarro-Payá, Lorenzo Bianco, **Can Nerse**, Jone Echeverria, Gastón Pizzio, Luca Pietro Casacci, José Tomás Matus, Sebastian Oberst, and Francesco Barbreo. From flight to communication: mechanisms and functions of wingbeat-generated sounds in insects. *Under review*, 2025

PUBLICATIONS

(* denotes equal contribution)

1. **Can Nerse**, Sebastian Oberst, Joseph C. S. Lai, and Theodore A. Evans. Design of an instrumented sandpit to monitor subterranean termite and ant activity in vibration bioassays. *Proceedings of the 31st International Congress on Sound and Vibration*, 2025
2. Jai Kumar -, **Can Nerse**, Omid Sedehi, Benjamin Halkon, Ulrike Dackermann, Joseph C. S. Lai, and Sebastian Oberst. A framework for vibration-based termite detection in timber structures. *Proceedings of the 31st International Congress on Sound and Vibration*, 2025

3. Ivan Sili, Abhishek Ray Mohapatra, Alberti Simona, **Can Nerse**, David Navarro-Payá, Francesca Barbero, Gastón Pizzio, Jone Echeverria, Lorenzo Bianco, Luca Pietro Casacci, Maria Rosaria Tucci, José Tomás Matus, and Sebastian Oberst. A review on the potential interaction of vibroacoustic and electrostatic plant-pollinator communication. *Proceedings of the Forum Acusticum / Euronoise*, 2025
4. Sungyeon Hong*, **Can Nerse***, Sebastian Oberst, and Mohammad Saadatfar. Topological mechanical states in geometry-driven hyperuniform materials. *PNAS Nexus*, pgae510, 2024
5. Abhishek Ray Mohapatra, **Can Nerse**, Sebastian Oberst, David Navarro-Payá, Jone Echeverria, José Tomás Matus, Lorenzo Bianco, Maria Rosaria Tucci, Luca Pietro Casacci, and Francesca Barbero. A study to classify wild bees' signal using time series analysis. *Proceedings of the 30th International Congress on Sound and Vibration*, 2024
6. Joy Liu, **Can Nerse**, and Sebastian Oberst. Influence on classification accuracy of partially annotated underwater animal sounds by combining Mel-spectra and recurrence plots. *Proceedings of the 30th International Congress on Sound and Vibration*, 2024
7. **Can Nerse**, Abhishek Ray Mohapatra, Sebastian Oberst, David Navarro-Payá, Jone Echeverria, José Tomás Matus, Lorenzo Bianco, Maria Rosaria Tucci, Elena Cumino, Luca Pietro Casacci, and Francesca Barbero. Model updating of flowering snapdragon (*Antirrhinum litigiosum*) biomechanical responses to vibroacoustic stimuli. *The Journal of the Acoustical Society of America*, 154 (4_supplement) A172–A172, 2023
8. Thien Tran, **Can Nerse**, Sebastian Oberst, Benjamin Halkon, Nader Sawalhi, and Shahrokh Sepehriahnama. Vibrational timber characterisation through the use of model updating. *The Journal of the Acoustical Society of America*, 154 (4_supplement) A75–A75, 2023
9. **Can Nerse**, Sebastian Oberst, David Navarro-Payá, Jone Echeverria, José Tomás Matus, Lorenzo Bianco, Luca Pietro Casacci, and Francesca Barbero. Propensity to efficiently transmit vibrations in snapdragons in response to vibroacoustic signalling. *Proceedings of the 29th International Congress on Sound and Vibration*, 2023
10. Sebastian Oberst, Shahrokh Sepehriahnama, **Can Nerse**, Zourab Brodzeli, Joseph C. S. Lai, Mark E. Mankowski, Tye Atkinson, Rachel Arango, Grant T. Kirker, and Theodore A. Evans. Towards a microactuator-sensing network for structural health monitoring of timber poles. *Proceedings of the IRG Annual Meeting*; (IRG/WP 23-50380), pp. 1–9, 2023
11. **Can Nerse**, Sebastian Oberst, Ian MacGillivray, and Stephen Moore. Assessment of flanking transmissions in measurements of sound transmission loss of multilayer panels. *Proceedings of the 28th International Congress on Sound and Vibration*, 2022
12. **Can Nerse** and Sebastian Oberst. Numerical vibration analysis of honeybee comb structures. *Proceedings of the 28th International Congress on Sound and Vibration*, 2022
13. **Can Nerse**, Richard Schadeberg, and Sebastian Oberst. Novel resonator geometry for easily manufactured tunable locally resonant metamaterial. *Proceedings of the Annual Conference of the Australian Acoustical Society*, 2022
14. Junmin Yu*, **Can Nerse***, Kyoung-jin Chang, and Semyung Wang. A framework of flexible locally resonant metamaterials for attachment to curved structures. *International Journal of Mechanical Sciences*, 201, 106533, 2021
15. **Can Nerse** and Semyung Wang. Modeling of complex modes with wave-based scaling. *Vibration Engineering for a Sustainable Future*, Vol 3, pp. 25–29, 2021
16. **Can Nerse** and Semyung Wang. Vibroacoustic characteristics of a damped box-type structure. *Proceedings of the INTER-NOISE and NOISE-CON Congress and Conference*, 2020

17. **Can Nerse**, Semyung Wang, and Seongyeol Goo. Effect of damping distribution on coupling in non-proportionally damped systems: conditions for optimality through a modal approach. *International Journal of Mechanical Sciences*, 187, 105908, 2020
18. **Can Nerse** and Semyung Wang. On the formation of complex modes in non-proportionally damped systems. *Journal of Sound and Vibration*, 463, 114978, 2019
19. Hyun-guk Kim*, **Can Nerse***, and Semyung Wang. Topography optimization of an enclosure panel for low-frequency noise and vibration reduction using the equivalent radiated power approach. *Materials and Design*, 183, 108125, 2019
20. Junmin Yu, **Can Nerse**, Giseok Lee, Semyung Wang, and Kyoung-jin Chang. Mass production applicable locally resonant metamaterials for NVH applications. *Proceedings of the 26th International Congress on Sound and Vibration*, 2019
21. Hyungwoo Kim, **Can Nerse**, Jongsuh Lee, and Semyung Wang. Multidisciplinary analysis and multiobjective design optimization of a switched reluctance motor for improving sound quality. *IEEE Access*, 7, 66020–66027, 2019
22. **Can Nerse** and Semyung Wang. The effect of damping distribution on coupling between multiple panel–cavity systems. *Proceedings of the 17th Asia Paci/c Vibration Conference*, 2017
23. Semyung Wang, **Can Nerse**, and Hyungwoo Kim. Vibro-acoustic noise analysis of a washing machine. *Sensors and Instrumentation*, Volume 5, pp. 47–53, 2017
24. **Can Nerse** and Semyung Wang. Experimental modal analysis of rolled multi-layer cylindrical shell. *Topics in Modal Analysis & Testing*, Volume 10, pp. 249–254, 2016
25. **Can Nerse**, Jongsuh Lee, and Semyung Wang. Study of rolled multi-layer cylindrical shell in frequency domain. *Proceedings of the 16th Asia Paci/c Vibration Conference*, 2015
26. **Can Nerse**, Semyung Wang, and Jongsuh Lee. Experimental and numerical modal analysis of cylindrical shell. *Proceedings of the Korean Society for noise and Vibration Conference*, 2015

CONFERENCE
PRESENTATIONS

1. Jone Echeverria, David Navarro-Payá, Gastón Pizzio, Lorenzo Bianco, Maria Rosaria Tucci, Abhishek Ray Mohapatra, Can Nerse, Carmen Grech, Marco Zuccaro, Tiffany Tomas, Salvador de Julián, Purificación Lisón, Pilar López, Jaime Guemes, Sebastian Oberst, Luca Pietro Casacci, Francesca Barbero, and José Tomás Matus. The sweet sound of pollination: identifying plant responses to vibroacoustic signals produced by their pollinators. *24th HFSP Awardees Meeting*, Melbourne, VIC, Australia, 9–11 July 2025 (Oral)
2. Can Nerse, Sebastian Oberst, Joseph C. S. Lai, and Theodore A. Evans. Design of an instrumented sandpit to monitor subterranean termite and ant activity in vibration bioassays. *31st International Congress on Sound and Vibration*, Incheon, South Korea, 6–11 July 2025 (Oral)
3. Jai Kumar -, Can Nerse, Omid Sedehi, Benjamin Halkon, Ulrike Dackermann, Joseph C. S. Lai, and Sebastian Oberst. A framework for vibration-based termite detection in timber structures. *31st International Congress on Sound and Vibration*, Incheon, South Korea, 6–11 July 2025 (Oral)
4. Jone Echeverria, David Navarro-Payá, Gastón Pizzio, Lorenzo Bianco, Maria Rosaria Tucci, Abhishek Ray Mohapatra, Can Nerse, Carmen Grech, Purificación Lisón, Pilar López, Sebastian Oberst, Luca Pietro Casacci, Francesca Barbero, and José Tomás Matus. Plant responses to pollinator vibroacoustic signals: effects on nectar and volatiles in *Antirrhinum litigiosum*. *Plant Biology Europe Congress*, Budapest, Hungary, 25–28 June 2025 (Poster)
5. Ivan Sili, Abhishek Ray Mohapatra, Alberti Simona, Can Nerse, David Navarro-Payá, Francesca Barbero, Gastón Pizzio, Jone Echeverria, Lorenzo Bianco, Luca Pietro Casacci,

- Maria Rosaria Tucci, José Tomás Matus, and Sebastian Oberst. A review on the potential interaction of vibroacoustic and electrostatic plant-pollinator communication. *Forum Acusticum / Euronoise*, Málaga, Spain, 23–26 June 2025 (Oral)
6. Lorenzo Bianco, Maria Rosaria Tucci, Jone Echeverria, Abhishek Ray Mohapatra, Can Nerse, David Navarro-Payá, Sebastian Oberst, José Tomás Matus, Luca Pietro Casacci, and Francesca Barbero. Exploring the impact of flower visitors’ behaviour on flight buzzing acoustic features. *International Society for Behavioral Ecology Congress*, Melbourne, VIC, Australia, 29 September–4 October 2024 (Oral)
 7. Abhishek Ray Mohapatra, Can Nerse, Sebastian Oberst, David Navarro-Payá, Jone Echeverria, José Tomás Matus, Lorenzo Bianco, Maria Rosaria Tucci, Luca Pietro Casacci, and Francesca Barbero. A study to classify wild bees’ signal using time series analysis. *30th International Congress on Sound and Vibration*, Amsterdam, Netherlands, 8–11 July 2024 (Oral)
 8. Joy Liu, Can Nerse, and Sebastian Oberst. Influence on classification accuracy of partially annotated underwater animal sounds by combining Mel-spectra and recurrence plots. *30th International Congress on Sound and Vibration*, Amsterdam, Netherlands, 8–11 July 2024 (Oral)
 9. Abhishek Ray Mohapatra, Can Nerse, David Navarro-Payá, Jone Echeverria, José Tomás Matus, Gastón Pizzio, Lorenzo Bianco, Luca Pietro Casacci, Maria Rosaria Tucci, and Francesca Barbero. Good Vibes: How do plants recognise and respond to pollinator vibroacoustic signals? *22nd HFSP Awardees Meeting*, Cape Town, South Africa, 6–8 December 2023 (Poster)
 10. Can Nerse, Abhishek Ray Mohapatra, Sebastian Oberst, David Navarro-Payá, Jone Echeverria, José Tomás Matus, Lorenzo Bianco, Maria Rosaria Tucci, Elena Cumino, Luca Pietro Casacci, and Francesca Barbero. Model updating of flowering snapdragon (*Antirrhinum litigiosum*) biomechanical responses to vibroacoustic stimuli. *AAS-ASA Joint Conference*, Sydney, NSW, Australia, 4–8 December 2023 (Oral)
 11. Thien Tran, Can Nerse, Sebastian Oberst, Benjamin Halkon, Nader Sawalhi, and Shahrokh Sepehrirahnama. Vibrational timber characterisation through the use of model updating. *AAS-ASA Joint Conference*, Sydney, NSW, Australia, 4–8 December 2023 (Oral)
 12. Can Nerse, Sebastian Oberst, David Navarro-Payá, Jone Echeverria, José Tomás Matus, Lorenzo Bianco, Luca Pietro Casacci, and Francesca Barbero. Propensity to efficiently transmit vibrations in snapdragons in response to vibroacoustic signalling. *29th International Congress on Sound and Vibration*, Prague, Czechia, 9–13 July 2023 (Oral)
 13. Sebastian Oberst, Shahrokh Sepehrirahnama, Can Nerse, Zourab Brodzeli, Joseph C. S. Lai, Mark E. Mankowski, Tye Atkinson, Rachel Arango, Grant T. Kirker, and Theodore A. Evans. Towards a microactuator-sensing network for structural health monitoring of timber poles. *IRG Annual Meeting*, Cairns, QLD, Australia, 28 May–1 June 2023 (Oral)
 14. Can Nerse, Sebastian Oberst, Ian MacGillivray, and Stephen Moore. Assessment of flanking transmissions in measurements of sound transmission loss of multilayer panels. *28th International Congress on Sound and Vibration*, Singapore, 24–28 July 2022 (Oral)
 15. Can Nerse and Sebastian Oberst. Numerical vibration analysis of honeybee comb structures. *28th International Congress on Sound and Vibration*, Singapore, 24–28 July 2022 (Oral)
 16. Can Nerse, Richard Schadeberg, and Sebastian Oberst. Novel resonator geometry for easily manufactured tunable locally resonant metamaterial. *Annual Conference of the Australian Acoustical Society*, Wollongong, NSW, Australia, 21–23 February 2022 (Oral)

17. Can Nerse and Semyung Wang. Vibroacoustic characteristics of a damped box-type structure. *INTER-NOISE and NOISE-CON Congress and Conference*, Seoul, South Korea, 23–26 August 2020 (Oral)
18. Can Nerse and Semyung Wang. Modeling of complex modes with wave-based scaling. 18th Asia Pacific Vibration Conference, Sydney, NSW, Australia, 18–21 November 2019 (Oral)
19. Cheol-seung Lim, Hyun-guk Kim, Giseok Lee, Can Nerse, and Semyung Wang. Composite optimization using OptiStruct for vibration reduction. *Korean Society of Mechanical Engineers Conference*, Jeju-do, South Korea, 13–16 November 2019 (Poster)
20. Giseok Lee, Can Nerse, Toan Nguyen, and Semyung Wang. A study of the frequency response due to slap phenomenon in two plates. *Korean Society for Noise and Vibration Engineering Conference*, Jeju-do, South Korea, 23–26 October 2019 (Poster)
21. Junmin Yu, Can Nerse, Giseok Lee, Semyung Wang, and Kyoung-jin Chang. Mass production applicable locally resonant metamaterials for NVH applications. 26th International Congress on Sound and Vibration, 7–11 July 2019 (Oral)
22. Junmin Yu, Can Nerse, Giseok Lee, Semyung Wang. Mass production-applicable locally resonant metamaterial. *Korean Society for Noise and Vibration Engineering Conference*, Pyeongchang, South Korea, 20–23 February 2019 (Oral)
23. Hyun-guk Kim, Can Nerse, and Semyung Wang. A study on topography optimization to reduce the radiated noise from the mechanical system powered by high performance rotating machinery. *Korean Society for Noise and Vibration Engineering Conference*, Gangwon-do, South Korea, 12–15 December 2018 (Oral)
24. Hayoung Baek, Can Nerse, Hyun-guk Kim, and Semyung Wang. Topology optimization of damping material attached on a plate with joint using structural intensity. *Korean Society for Noise and Vibration Engineering Conference*, Yeosu, South Korea, 17–20 October 2018 (Poster)
25. Hyun-guk Kim, Can Nerse, Seongyeol Goo, and Semyung Wang. Design optimization of cover panel of engine-included system using topography optimization. 6th International Conference on Engineering Optimization, Lisboa, Portugal, 17–19 September 2018 (Poster)
26. Can Nerse and Semyung Wang. The effect of damping distribution on coupling between multiple panel–cavity systems. 17th Asia Pacific Vibration Conference, Nanjing, China, 13–15 November 2017 (Oral)
27. Can Nerse and Semyung Wang. Structural–acoustic coupling in non-proportionally damped systems. *Korean Society for Noise and Vibration Engineering Conference*, Yesan, South Korea, 18–20 October 2017 (Oral)
28. Seung-jae Oh, Hyungwoo Kim, Can Nerse, and Semyung Wang. Sound-based washing machine fault diagnosis using similarity matrix. *Korean Society for Noise and Vibration Engineering Conference*, Gwangju, South Korea, 26–28 April 2017 (Oral)
29. Can Nerse, Semyung Wang, and Hyungwoo Kim. Operational noise analysis of a washing machine using source-path-receiver approach. *Korean Society for Noise and Vibration Engineering Conference*, Gwangju, South Korea, 26–28 April 2017 (Oral)
- Invited paper**
30. Semyung Wang, **Can Nerse**, and Hyungwoo Kim. Vibro-acoustic noise analysis of a washing machine. *IMAC XXXV - A Conference and Exposition on Structural Dynamics*, Orange County, CA, USA, 30 Jan–2 February 2017 (Oral)
31. Can Nerse and Semyung Wang. Experimental modal analysis of rolled multi-layer cylindrical shell. *IMAC XXXV - A Conference and Exposition on Structural Dynamics*, Orange County, CA, USA, 25–28 January 2016 (Oral)

32. Can Nerse, Jongsuh Lee, and Semyung Wang. Study of rolled multi-layer cylindrical shell in frequency domain. *16th Asia Pacific Vibration Conference*, Hanoi, Vietnam, 24–26 November 2015 (Oral)

33. Can Nerse, Semyung Wang, and Jongsuh Lee. Experimental and numerical modal analysis of cylindrical shell. *Korean Society for Noise and Vibration Engineering Conference*, Jeju-do, South Korea, 22–25 April 2015 (Oral)

HONORS AND AWARDS

President’s Award (Honors), GIST, 2020

Publication Prize, GIST, 2019

Dean’s List, GIST, 2014

Korean Government Graduate Scholarship, 2013 – 2019

Ranked in Top 100 (among 270,000) in National Graduate Entrance Exam (ALES)

TEACHING EXPERIENCE

University of Technology Sydney, Sydney, NSW, Australia

Tutor, Embedded Mechatronics Systems [UG]

Autumn 2023, 2024, 2025

Tutor, Dynamics and Control [UG]

Autumn 2021, Spring 2021

Gwangju Institute of Science and Technology, Gwangju, South Korea

Teaching Assistant, Optimal Design [UG/PG]

Fall 2017

Teaching Assistant, Sound and Vibration [UG]

Fall 2016

PROFESSIONAL SERVICE

Lab Coordinator, Biogenic Dynamics Laboratory, 2021 – 2025

Member, Graduate Admission Committee, 2024

Organiser, Capstone Showcase Committee, 2021 – 2024

Organiser, FEIT Student Expo, 2021 – 2024

Lab Manager, Intelligent System Design Laboratory, 2019

Organiser, GIST Student Expo, 2015 – 2018

Reviewer: Journal of Sound and Vibration, Mechanical Systems and Signal Processing, Journal of the Acoustical Society of America, Applied Acoustics, PLoS One, Scientific Reports

Member: International Institute of Acoustics and Vibration (IIAV), Korean Society of Noise and Vibration Engineering (KSNVE), Society for Experimental Mechanics (SEM)