Zibo Liu

Curriculum Vitae

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1. CONTACT INFORMATION

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Google Scholar:	https://scholar.google.se/citations?user=OZhmCYwAAAAJ

2. WORK EXPERIENCE

01/2023 – present **Acoustic Research Engineer, Scania Technical Center, Stockholm**
Structural Dynamics & Acoustics Simulation Group
Scania Technical Center (STC), Scania Group, Stockholm, Sweden
Key responsibilities:
• Development of advanced simulation methods for structural dynamics and NVH control to support next-generation silencer system design
• Lead the development of the simulation roadmap for structural dynamics and NVH at Scania
• Physics-informed root cause analysis of vehicle noise issues
• Project manager for truck cabin soundscape design initiative
• Supervision of master's thesis projects with Swedish universities

(01/2025 – present) **Affiliated Researcher, KTH, Stockholm**
The Marcus Wallenberg Laboratory for Sound and Vibration Research
Department of Engineering Mechanics, KTH Royal Institute of Technology, Stockholm
Key responsibilities:
• Define and initiate collaborative research projects between Scania, KTH, and UCL (for, e.g., Vinnova, FFI, etc.), including: (1) soundscape project with Karl Börling; (2) structure-borne sound source representation with Romain Rumpler; (3) Co-PI of the research project "SMILE City: A Pre-study", aiming at interdisciplinary exchange between acoustic metamaterials and soundscape
• Regular research engagement at KTH (Fridays)

(01/2024 – 01/2025) **Affiliate Academic, UCL, London (Frequent travel to/from STC)**
Acoustic Research Group, Institute for Environmental Design and Engineering (IEDE)
University College London (UCL), London, UK
Key responsibilities:
• Leading a soundscape pilot project partnership between Scania and UCL
• Applying soundscape principles to truck cabin acoustic design
• Hosts: Dr. Francesco Aletta and Professor Jian Kang

05/2021 – 04/2023 **Postdoctoral Researcher, Tsinghua University, Beijing**
State Key Laboratory of Tribology in Advanced Equipment

Department of Mechanical Engineering, Tsinghua University, Beijing, China
(As of 2025, Tsinghua ranked #20 worldwide and #1 in China by QS)
Key responsibilities:
• PI of two research projects on phonons and superlubrication
• Led a weekly focus group on "Phonons and Phononic Crystals"
• Co-supervised two PhD students and master's students
• Guest lecturer for "Nanomanufacturing and Interface Science" course
• Host: Professor Dameng Liu

(07/2022 – 03/2023) **Visiting Postdoctoral Researcher, KTH, Stockholm**
The Marcus Wallenberg Laboratory for Sound and Vibration Research
Department of Engineering Mechanics, KTH Royal Institute of Technology, Stockholm
Key responsibilities:
• Investigated design principles of acoustic metamaterials and superlattices
• Contributed to the FINE-2 Project
• Host: Associate Professor Romain Rumpler

04/2019 – 04/2021 **Assistant Researcher, CAS, Beijing**
Institute of Acoustics, Chinese Academy of Sciences (CAS), Beijing, China
Key responsibilities:
• Project manager for "SAFES" simulation package development
• Developed models and machine learning frameworks for thermal and acoustic insulation
• Led panel discussions and reporting to stakeholders

3. EDUCATIONAL QUALIFICATIONS

09/2014 – 03/2019 **PhD in Engineering Acoustics, KTH, Stockholm**
The Marcus Wallenberg Laboratory for Sound and Vibration Research
Department of Engineering Mechanics, KTH Royal Institute of Technology, Sweden
Thesis: "Design of Soundproof Panels via Metamaterial Concept"
Degree awarded: 11/04/2019 in Vehicle and Maritime Engineering
Supervisors: Dr. Leping Feng and Dr. Romain Rumpler

09/2011 – 06/2014 **Master of Science in Theoretical Acoustics, NUDT, Changsha**
National University of Defense Technology (NUDT), Changsha, China
Thesis: "Acoustic Lens Design for Sound Focusing"
Supervisor: Professor Xinwu Zeng

09/2007 – 06/2011 **B.Eng. in Applied Mechanics (Major) & BBA (Minor)**
Beijing Institute of Technology, Beijing, China

4. DEDUCTIBLE TIME

None applicable.

5. RESEARCH GRANTS

G1. 01/2026 – 12/2029 **Soundscape engineering with Metamaterial Innovation and Learning (SMILE)**
Role: Principal Investigator

Amount: 3,500,000 SEK
Funding agency: Vetenskapsrådet (Swedish Research Council)
Project identifier: No. 2025-06253
Focus: Research project grant within natural and engineering sciences

G2. 08/2025 – 06/2026 **SMILE City: A Pre-study**
Role: Co-PI (Established collaboration between UCL and KTH)
Amount: 60,000 SEK (KTH) + £5,000 GBP (UCL)
Funding agency: Stockholm Trio – UCL Collaborative Seed Funding
Project identifier: 2025/26
Focus: Interdisciplinary exchange between acoustic metamaterials and soundscape for traffic noise mitigation in urban parks

G3. 03/2025 – 09/2025 **Sound Design: Prestudy**
Role: Principal Investigator
Amount: 500,000 SEK (approx. $48,000 USD)
Funding agency: Scania Research Office
Project identifier: 202501271723
Focus: Soundscape studies for enhanced driver comfort in vehicle cabins

G4. 01/2022 – 12/2024 **An Investigation of the Moiré Phonon Contribution to the Energy Dissipation in Nanofriction**
Role: Principal Investigator
Amount: 300,000 RMB (approx. $41,000 USD)
Funding agency: National Natural Science Foundation of China
Project identifier: No. 52205209

G5. 06/2022 – 06/2024 **Superlubrication Enabled by Superlattices for Low-Dimensional Materials**
Role: Principal Investigator
Amount: 80,000 RMB (approx. $11,000 USD)
Funding agency: China Postdoctoral Science Foundation
Project identifier: No. 2022M711805

G6. 05/2021 **Postdoctoral Fellowship**
Amount: Full research funding for postdoctoral position
Host institution: Tsinghua University, China
Funding agency: Office of China Postdoc Council (OCPC)
Fellowship identifier: No. 283854

G7. 05/2014 **Doctoral Fellowship**
Amount: Full doctoral study funding
Host institution: KTH Royal Institute of Technology, Sweden
Funding agency: China Scholarship Council (CSC)
Fellowship identifier: No. 201403170345

6. SUPERVISION EXPERIENCE

Previous Supervision (Scania)

- **Master's Thesis Students** (2024-2025)
  - Vivek Rajkumar Anbazhagan, Linköping University
    - Project: "Semi-1D Acoustic Simulation for Silencer Design"
    - Role: Project lead and initiator, Main supervisor
  - Merna Danka & Hannes Salomonsson, KTH Royal Institute of Technology
    - Project: "Soundscape Approach for Cabin Acoustics"

    - * Role: Project lead and initiator, Main supervisor
  - Chenhao Bi, University College London
    - * Project: "Soundscape Approach for Cabin Acoustics"
    - * Role: Project lead and initiator, Co-supervisor

Previous Supervision (Tsinghua University)

- **PhD Students** (2021-2023)
  - Haolei Dai, Tsinghua University (admitted 2020)
    - * Research focus: Phonon contribution to energy dissipation in nanofriction
    - * Role: Co-supervisor
  - Yujin Wang, Tsinghua University (admitted 2021)
    - * Research focus: Superlubrication enabled by superlattices via phonon engineering
    - * Role: Co-supervisor
- **Master's Student** (2020-2021)
  - Lujie Xu, Joint program between Tsinghua University and Beijing Electronic Science and Technology Institute
    - * Research focus: Phononic crystals for energy dissipation control
    - * Role: Co-supervisor

7. TEACHING EXPERIENCE

Spring 2022, 2023	**Guest Lecturer** Course: "Nanomanufacturing and Interface Science" Department of Mechanical Engineering, Tsinghua University *Level:* Graduate (approx. 20 students per semester) *Content:* Lectures on phonon properties and engineering in nanoscale materials
2021-2023	**Research Group Seminar Leader** Weekly focus group: "Phonons and Phononic Crystals" State Key Laboratory of Tribology in Advanced Equipment, Tsinghua University *Level:* Graduate and doctoral students (6-8 participants) *Content:* Advanced topics in phonon engineering and metamaterials

8. PEDAGOGICAL COURSES

03/2022	**Research Supervision and Mentoring** Tsinghua University, Center for Faculty Development *Duration:* 16 hours *Content:* Effective strategies for research student supervision
09/2016	**Basic Communication and Teaching** KTH Royal Institute of Technology, School of Education and Communication *Duration:* 20 hours *Content:* Basic pedagogical theory and practice for engineering education

9. ACADEMIC CITIZENSHIP

Collegiality

- **Strategic Development** (2023–present)
  - Led the design and implementation of Scania's simulation roadmap for structural dynamics and NVH, aligning long-term R&D priorities with vehicle development needs
- **Research Group Leadership** (2021-2023)
  - Established and led weekly research discussions on phonon engineering at Tsinghua University
  - Created collaborative research environment for interdisciplinary projects
- **Mentorship** (2020-present)
  - Informal mentoring of junior researchers and graduate students
  - Supporting early-career researchers in publication strategy and research planning

Academic Tasks within Home University

- **Laboratory Equipment Committee Member** (2022-2023)
  - State Key Laboratory of Tribology in Advanced Equipment, Tsinghua University
  - Evaluated and recommended research equipment acquisitions
- **Research Safety Protocol Developer** (2021-2022)
  - Developed laboratory safety protocols for nanomaterial handling
  - Conducted safety training sessions for new research students

Academic Tasks beyond Home University

- **Journal Reviewer** (2018-present)
  - Regular reviewer for journals including:
    - *Mechanical Systems and Signal Processing* (5+ reviews)
    - *International Journal of Mechanical Sciences* (4+ reviews)
    - *Journal of Sound and Vibration* (3+ reviews)
    - *Thin-Walled Structures* (3+ reviews)
    - *Applied Acoustics* (3+ reviews)
    - *JASA Express Letters* (2+ reviews)
- **Conference Session Chair** (2021)
  - Session: "Metamaterials for Noise Control"
  - 27th International Congress on Sound and Vibration (ICSV 27, Virtual)
- **FINE-2 Project Contributor** (2022-2023)
  - Contributed to EU Shift2Rail initiative research project
  - Collaborated with international research partners

Academic Leadership Tasks

- **Project Manager, Sound Design Initiative at Scania** (2024–present)

  - Leading Scania's cross-functional sound design efforts focused on cabin soundscape perception and brand sound identity
  - Coordinating internal stakeholders and academic collaborators to implement soundscape methodology in vehicle development

- **Research Partnership Developer at Scania** (2024-present)
  - Established new research collaboration between Scania, UCL and KTH
  - Developed strategic research roadmap for acoustics and soundscape innovation

- **Project Manager, SAFES Project** (2019-2021)
  - Led cross-sector collaborative project with industry and academic partners
  - Managed project team, budget ($100,000+ USD), and deliverables
  - Coordinated with stakeholders including Shanghai Nuclear Engineering Research and Design

10. INVITED PRESENTATIONS/REVIEWS/LECTURES

07/2024	**"An Engineering Framework Towards a Better Soundscape in Truck Cabins Using Metamaterial Absorber"** 30th International Congress on Sound and Vibration (ICSV 30) Amsterdam, Netherlands Type: Oral presentation
07/2021	**"Design of Curved Sandwich Panels to Overcome the Ring Frequency and Coincidence Effects"** 27th International Congress on Sound and Vibration (ICSV 27) Virtual event Type: Oral presentation
06/2021	**"Curved Double Wall with Embedded Resonators to Improve the Sound Transmission Loss"** 24th International Conference on Composite Structures Virtual event, University of Porto, Portugal Type: Oral presentation
07/2018	**"Investigation on the Acoustic Behaviour of the Locally Resonant Metamaterial Curved Panel"** 25th International Congress on Sound and Vibration (ICSV 25) Hiroshima, Japan Type: Oral presentation
06/2017	**"Design of Broadband Acoustic Metamaterials for Low-Frequency Noise Insulation"** Acoustics'17 Boston, Massachusetts, USA Type: Oral presentation
06/2016	**"A Finite Element Model for the Vibro-Acoustic Analysis of Plates and Sandwich Structures"** Baltic-Nordic Acoustics Meeting (BNAM 2016) Stockholm, Sweden Type: Oral presentation

11. UTILISATION OF RESEARCH OUTSIDE ACADEMIA

Industry-Academia Collaborations

- **Scania-UCL Soundscape Collaboration** (2024-present)
  - Pioneered application of soundscape principles to truck cabin acoustics
  - Developing innovative acoustic comfort solutions for commercial vehicles
  - Translating academic research into practical industry applications
- **SAFES Project for Nuclear Industry** (2019-2021)
  - Led cross-sector collaboration with Shanghai Nuclear Engineering Research and Design
  - Developed innovative thermal-acoustic insulation models for nuclear power plants
  - Implemented machine learning optimization frameworks for practical applications
  - Delivered open-source simulation package, journal publication, and patents

Knowledge Transfer and Public Engagement

- **Industry Workshops** (2024-present)
  - Conducted workshops on acoustic simulation for engineers at Scania
  - Presented noise control technologies to industry partners
- **Open-Source Software Development** (2021)
  - Created SooMa: Open-source package for estimating Sound Insertion Loss of Multilayer Pipeline Jacket Systems
  - Developed STransLAMP: Open-source toolbox for calculating Sound Transmission Loss of Acoustic Metamaterial Panels
  - Made advanced acoustic simulation tools accessible to broader engineering community

12. PATENTS

P1. **Chinese Invention Patent CN115343269B** (Granted 2023-10-03)

- Title: "A method and system for regulating the thermal conductivity of materials based on phonon defect engineering."
- Co-inventors: Dameng Liu, Yujin Wang, Haolei Dai, Zibo Liu.
- Published application: CN115343269A (2022-11-15).

P2. **Chinese Utility Model Patent CN214895044U** (Granted 2021-11-26)

- Title: "A test rig for evaluating the sound insulation performance of pipeline insulation wrapping structures."
- Co-inventors: Wuzhou Yu, *et al.* (incl. Zibo Liu).
- Provides a standardized bench setup for accurate and repeatable acoustic performance evaluation.

P3. **Chinese Invention Patent CN112834624B** (Granted 2024-08-13)

- Title: "A test bench and test method for evaluating the sound insulation performance of pipeline insulation wrapping structures."
- Co-inventors: Wuzhou Yu, *et al.* (incl. Zibo Liu).
- Establishes a repeatable evaluation method linking bench measurements to insulation-structure design and optimization.

Patents in Preparation:

- **Swedish Patent Application** (In preparation with Scania Patent Office)
  - Title: "Cantilever Resonator and Metamaterial Treatment for Suppressing Sound Radiation from Structures"
  - Inventor: Zibo Liu, Matthias Tidlund, Surafel Tesema
  - Novel acoustic metamaterial design for structural noise reduction
- **Swedish Patent Application** (In preparation with Scania Patent Office)
  - Title: "System and Method for Acoustic Optimization of Vehicle Exhaust Silencers Using DOE and Model Decomposition Technique"
  - Inventor: Zibo Liu, Vivek Rajkumar Anbazhagan
  - Advanced computational method combining simulation techniques for acoustic analysis and optimization

13. MEMBERSHIP OF COLLABORATIONS AND ORGANIZATIONS

Research Collaborations

- **Scania-UCL Research Partnership** (2024-present)
  - Founding member and project leader
  - Focus on soundscape applications in vehicle acoustics
- **FINE-2 Project (European Shift2Rail Initiative)** (2022-2023)
  - Contributing researcher
  - Focus on railway noise and vibration control

Professional Organizations

- **Acoustical Society of America** (2016-present)
  - Member
- **International Institute of Acoustics and Vibration** (2017-present)
  - Member

14. OTHER MERITS

Academic Recognition

- **KTH Royal Institute of Technology** (02/2023)
  - Ranked 3rd for Assistant Professor in Engineering Acoustics position (VL-2021-0125)
- **Eindhoven University of Technology (TU/e)** (11/2022)
  - Selected as one of the finalists for Assistant Professor in Acoustic Materials position
- **Marie Skłodowska-Curie Postdoctoral Fellowship Evaluation** (02/2022)
  - Final score: 84.6% on proposal submission
  - Evaluation highlight: "The proposal is both original and innovative... The researcher has adequate overall experience, a good record of publications in high impact journals and participation in research projects."

- **Sun Yat-sen University (SYSU)** (02/2021)
  - Received Assistant Professor offer from SYSU, a QS top 300 and China top 10 university, through the prestigious "One Hundred Talents" program

Prizes and Awards

- **China Postdoctoral Science Foundation Fellowship** (2022)
- **CSC Scholarship, China Scholarship Council** (2014)
- **Excellent Master Thesis Award** (2014)
  - National University of Defense Technology
- **Excellent Graduate Award** (2011)
  - Beijing Institute of Technology

Research Skills

- **Acoustic Simulation**
  - Advanced FEM and BEM modeling
  - Numerical methods for vibroacoustics
  - Commercial software: COMSOL, Actran, etc.
- **Experimental Techniques**
  - Acoustic testing and characterization
  - Raman spectroscopy for material analysis
  - Nanoscale material characterization
- **Programming and Data Analysis**
  - MATLAB, Python, R
  - Machine learning frameworks
  - Statistical methods for experimental data

15. PUBLICATIONS LIST

Summary of Bibliometric Information

- Total number of publications: 12 journal articles, 4 conference papers, 3 patents, 3 open-source software packages, 1 popular science article
- Total citations: 428 (Source: Google Scholar; auto-updated on March 21, 2026)
- h-index: 8 (Source: Google Scholar; auto-updated on March 21, 2026)

Five Most Relevant Publications

1. **Liu, Z.**, Rumpler, R., Feng, L. (2021). "Locally resonant metamaterial curved double wall to improve sound insulation at the ring frequency and mass-spring-mass resonance." *Mechanical Systems and Signal Processing*, 149, 107179.
   - **My role:** Conceptualized the research, developed theoretical models, conducted numerical simulations, analyzed results, and wrote the manuscript.

- **Significance:** A metamaterial-based design approach addressing poor sound insulation in double-wall structures widely used in aeronautical and maritime engineering.

2. **Liu, Z.**, Rumpler, R., Sun, H., Li, Q., Liu, D., Yu, W. (2021). "Improving sound insulation near ring and coincidence frequencies of cylindrical sandwich shells." *International Journal of Mechanical Sciences*, 235, 107681.

   - **My role:** Led the research, developed the impedance-based design approach, performed numerical analysis, and drafted the manuscript.
   - **Significance:** An impedance-based design approach for sandwich shells to improve acoustic properties while maintaining lightweight construction.

3. **Liu, Z.**, Rumpler, R., Feng, L. (2019). "Investigation of the sound transmission through a locally resonant metamaterial cylindrical shell in the ring frequency region." *Journal of Applied Physics*, 125(11), 115105.

   - **My role:** Designed the research methodology, conducted theoretical analysis and numerical simulations, and wrote the manuscript.
   - **Significance:** Physical insights on acoustic properties of locally resonant metamaterial-based shells, establishing groundwork for practical engineering applications.

4. **Liu, Z.**, Rumpler, R., Feng, L. (2018). "Broadband locally resonant metamaterial sandwich plate for improved noise insulation in the coincidence region." *Composite Structures*, 200, 165-172.

   - **My role:** Developed the concept, conducted analytical and numerical studies, performed experimental validation, and prepared the manuscript.
   - **Significance:** A metamaterial-based lightweight design approach for sandwich plates featuring broad bandgap and significant acoustic insulation properties. The practical potential attracted industrial funding to initiate manufacturing.

5. Wang, Y., Dai, H., **Liu, Z.** (corresponding author), Liu, D. (2023). "Van Hove Singularity Modulation of Phonon Transport in Twisted Bilayer Graphene." *The Journal of Physical Chemistry C*, 127(49), 23752-23759.

   - **My role:** Conceived the research concept, supervised the investigations, provided theoretical guidance, and critically revised the manuscript.
   - **Significance:** Demonstrated how phonon transport properties can be controlled through van Hove singularity manipulation, with implications for thermal management in nanoscale devices.

Preprints

P1. **Liu, Z.**, Fang, X., Oberman, T., Indolia, N., Habibovic, A., Aletta, F., Mitchell, A., Kang, J. "The Influence of Visual Context on Truck Cabin Soundscape Perception." *TechRxiv preprint.* DOI: 10.36227/techrxiv.176366537.73500767/v1.

Accepted Publications (in press)

- *Status:* None at the moment.

Journal Articles (full publication list)

J1. Hao, Y., Liu, D., Luo, L., Mu, J., Wang, H., **Liu, Z.**, Li, J., Zhu, Z., Guo, Q., Yang, B. (2025). "Searching for topological semi-complete bandgap in elastic truss lattices." *Advanced Science.* DOI: 10.1002/advs.202511884.

J2. Dai, H., Wang, Y., **Liu, Z.**, Liu, Y., Guo, Y., Liu, D. (2025). "Interlayer phononic energy dissipation in the friction of graphene layers." *Science Advances*, 11(22), eadu2880.

J3. Dai, H., Wang, Y., Zhao, J., Liu, H., **Liu, Z.** (corresponding author), Liu, D. (2024). "Enhanced double resonance Raman scattering in multilayer graphene with broadband coherent anti-Stokes Raman spectroscopy." *Nanoscale*, 16(3), 1247-1253.

J4. Wang, Y., Dai, H., **Liu, Z.** (corresponding author), Liu, D. (2023). "Phonon Scattering in Monolayer Molybdenum Disulfide under Different Defect Concentrations Based on Temperature-Dependent Raman Spectra." *The Journal of Physical Chemistry C*, 127(2), 1109-1116.

J5. Wang, Y., Dai, H., **Liu, Z.** (corresponding author), Liu, D. (2023). "Van Hove Singularity Modulation of Phonon Transport in Twisted Bilayer Graphene." *The Journal of Physical Chemistry C*, 127(49), 23752-23759.

J6. Xie, C., Meng, L., **Liu, Z.**, Yang, F., Jiang, X., Yang, J. (2023). "Multifunctional integrated underwater sound absorption materials: a review." *Applied Sciences*, 13(9), 5638.

J7. Li, X., Zhang, R., **Liu, Z.**, Pu, Y. (2022). "Molecular dynamics study on friction of the iron-aluminum alloy." *Materials Today Communications*, 33, 104402.

J8. **Liu, Z.**, Rumpler, R., Sun, H., Li, Q., Liu, D., Yu, W. (2021). "Improving sound insulation near ring and coincidence frequencies of cylindrical sandwich shells." *International Journal of Mechanical Sciences*, 235, 107681.

J9. **Liu, Z.**, Rumpler, R., Feng, L. (2021). "Locally resonant metamaterial curved double wall to improve sound insulation at the ring frequency and mass-spring-mass resonance." *Mechanical Systems and Signal Processing*, 149, 107179.

J10. **Liu, Z.**, Rumpler, R., Feng, L. (2019). "Investigation of the sound transmission through a locally resonant metamaterial cylindrical shell in the ring frequency region." *Journal of Applied Physics*, 125(11), 115105.

J11. Song, Y., Feng, L., **Liu, Z.**, Wen, J., Yu, D. (2019). "Suppression of the vibration and sound radiation of a sandwich plate via periodic design." *International Journal of Mechanical Sciences*, 150, 744-754.

J12. **Liu, Z.**, Rumpler, R., Feng, L. (2018). "Broadband locally resonant metamaterial sandwich plate for improved noise insulation in the coincidence region." *Composite Structures*, 200, 165-172.

Conference Proceedings

C1. **Liu, Z.**, Fang, X., Nicola, N., Oberman, T., Aletta, F., Kang, J. (2024). "An engineering framework towards a better soundscape in truck cabins using a metamaterial absorber." In: *Proceedings of the 30th International Congress on Sound and Vibration.* The International Institute of Acoustics and Vibration: Amsterdam, Netherlands.

C2. **Liu, Z.**, et al. (2021). "Design of curved sandwich panel to overcome the ring frequency and coincidence effects." In *27th International Congress on Sound and Vibration, ICSV 2021, 11-16 July 2021, Virtual, Online.* Silesian University Press.

C3. **Liu, Z.**, Feng, L., Rumpler, R. (2018). "Investigation on the acoustic behaviour of a locally resonant metamaterial curved panel." In *25th International Congress on Sound and Vibration 2018*, vol. 6, pp. 3409-3416.

C4. **Liu, Z.**, Feng, L., Rumpler, R. (2017). "Design of broadband acoustic metamaterials for low-frequency noise insulation." *The Journal of the Acoustical Society of America*, 141(5), 3574-3574.

Open-Source Software

O1. **Liu, Z.** (2026). *MetaSandwich-IL-Jacket*: Pipeline jacket insertion loss (IL) analysis using the Transfer Matrix Method. GitHub: github.com/zibo-kth/MetaSandwich-IL-Jacket.

O2. **Liu, Z.** (2026). *MetaSandwich-STL*: Sound transmission loss (STL) toolbox for acoustic metamaterial panels. GitHub: github.com/zibo-kth/MetaSandwich-STL.

O3. **Liu, Z.** (2026). *acoustic-sandwich-waves*: Research code for acoustic wave propagation in sandwich structures (dispersion/wavenumber solver + automated figures). GitHub: github.com/zibo-kth/acoustic-sandwich-waves.

Popular Science Publications

P1. **Liu, Z.**, Rumpler, R. (2025). "Sonisk Alkemi, – Metamaterial och ljudlandskap för en tystare, grönare stad" (Sonic Alchemy – Metamaterials and Soundscapes for a Quieter, Greener City). *Bygg & teknik*, Tema: Akustik och ljudisolering. [**Invited article**] Available *here*

Doctoral Thesis

- **Liu, Z.** (2019). *Design of Soundproof Panels via Metamaterial Concept*. Doctoral Thesis, KTH Royal Institute of Technology. Available through: DiVA portal