Garuda Fujii

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CONTACT INFORMATION

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LINKS

Google Scholar https://scholar.google.com/citations?user=I_bR7qgAAAAJ

Scopus https://www.scopus.com/authid/detail.uri?authorId=54881766400

Web of Science https://www.webofscience.com/wos/author/record/1648056

schalorGPS

https://scholargps.com/scholars/80550560005940/garuda-fujii

Employment

Professor	Nagano, Japan
Department of Mechanical Systems Engineering, Faculty of Engineering, Shinshu University	2023–Current
Associate Professor	Nagano, Japan
Department of Mechanical Systems Engineering, Faculty of Engineering, Shinshu University	2019–2022
Assistant Professor	Nagano, Japan
Department of Mechanical Systems Engineering, Faculty of Engineering, Shinshu University	2013–2018
Assistant Professor	Akita, Japan
Department of Machine Intelligence and Systems Engineering, Akita Prefectural University	2012–2013

EDUCATION

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Doctor of Engineering	Nagoya, Japan
Department of Mechanical Science and Engineering, Nagoya University	2009–2011
Master of Engineering	Nagoya, Japan
Department of Mechanical Science and Engineering, Nagoya University	2007–2008
Bachelor of Engineering	Nagoya, Japan
Department of Mechanical and Aerospace Engineering, Nagoya University	2003–2006
Fellowships and Awards	
• Young Investigator Award by Japan Association for Computational Mechanics	2024
• The round Sciencists Award, The Commendation for Science and Technology	

by the Minister of Education, Culture, Sports, Science and Technology (MEXT) 2023

• Frontier Achievement Award by Design & Systems Division of The Japan Society of Mechanical Engineers	2021
• Encouragement and Achievement Award by Design & Systems Division of The Japan Society of Mechanical Engineers	2017
• Best Presentation Award by Japan Society for Computational Methods in Engineering	2011
• Young Researcher's Award by Nagoya University	2011
• Overseas Study Grant for Doctoral Program from Graduate School of Engineering, by Nagoya University	2011
• Overseas Study Grant for Doctoral Program from Graduate School of Engineering, by Nagoya University	2010
• Young Researchers' Activities Expenses by Micro-Nano Global COE, Nagoya University	2009

TEACHING

At Shinshu University	
Advanced Structural Optimization (HS231400)	Spring 2025 – Current
Advanced Engineering Optimization (HS230400)	Spring 2018 – 2025
Advanced Numerical Analysis (X2151)	Spring $2015 - 2018$
Computational Mechanics (TSR09500)	Spring $2016 - Current$
Mechanical Engineering Drawing 2 (T4004200)	Spring 2024 – Current
Experiments in Mechanical Systems Engineering (T4010300)	Spring 2022 – Current
Practice for Strength of Materials (T4043200)	Autumn 2019 – Current
Basic Exercise on Computer Programming (T4011209)	Autumn 2017 – Current
Advanced Environmental Technique (T6220)	Spring $2014 - 2016$
Drawing in Environmental Science and Technology (T6215)	Spring $2014 - 2016$
Environmantal Science and Technology Experiments 1 (T6217)	Spring 2014 – 2015
At Akita Prefectural University	
Experiments in Machine Intelligence Systems (HS231400)	Spring 2025 – Current

Publications

Physics Experiments (HS230400)

Journal Papers: [Corresponding Author*]

- Seitaro Kato, Kohei Takejima, Zhiqian Song, and <u>Garuda Fujii</u>*, Density-based topology optimization for itr-free thermal cloaks, *International Journal of Heat and Mass Transfer*, Vol. 242, p. 126834 (2025), [2024 Impact Factor: 5.0].
- [2] Shin Tanaka and <u>Garuda Fujii</u>*, CMA-ES-based topology optimization accelerated by spectral level-set-boundary modeling, *Computer Methods in Applied Mechanics and Engineering*, Vol. 432, p. 117331 (2024), [2023 Impact Factor: 6.9].
- [3] Garuda Fujii^{*}, Topology-optimized source shifter for optical location camouflaging, *Optics Express*, Vol. 31, No. 22, pp. 37302–37315 (2023), [2022 Impact Factor: **3.8**].
- [4] Garuda Fujii^{*}, Camouflaging the location of a sound source via topology-optimized source-shifter, *Journal of Sound and Vibration*, Vol. 559, p. 117768 (2023), [2022 Impact Factor: **4.761**].

Spring 2018 - 2025

- [5] <u>Garuda Fujii</u>*, Biphysical undetectable concentrators manipulating both heat flux and direct current via topology optimization, *Physical Review E*, Vol. 106, Issue 6, p. 065304 (2022), [2022 Impact Factor: 2.707].
- [6] Kazuma Hirasawa, Iona Nakami, Takumi Ooinoue, Tatsunori Asaoka, and <u>Garuda Fujii</u>*, Experimental demonstration of thermal cloaking metastructures designed by topology optimization, *International Journal of Heat and Mass Transfer*, Vol. 194, p. 123093 (2022), [2021 Impact Factor: 5.431].
- [7] <u>Garuda Fujii</u>^{*} and Youhei Akimoto, Electromagnetic-acoustic biphysical cloak designed through topology optimization, *Optics Express*, Vol. 30, No. 4, pp. 6090–6106 (2022), [2021 Impact Factor: **3.894**].
- [8] Motoaki Ota and Garuda Fujii^{*}, Mechanical unfeelability concentrator through topology optimization, Applied Physics Letters, Vol. 120, No. 1, p. 011103 (2022), [2021 Impact Factor: **3.791**].
- [9] <u>Garuda Fujii</u>*, Masayuki Takahashi, and Youhei Akimoto, Acoustic cloak designed by topology optimization for acoustic-elastic coupled systems, *Applied Physics Letters*, Vol. 118, No. 10, p. 101102 (2021), [2021 Impact Factor: **3.791**].
- [10] Tsuyoshi Ueta*, <u>Garuda Fujii</u>, and Gen Morimoto, Full-model finite-element analysis for structural color of Tarsiger cyanurus's feather barbs, *Forma*, Vol. 35, No. 1, pp. 21–26 (2020).
- [11] Garuda Fujii* and Youhei Akimoto, dc electric cloak concentrator via topology optimization, *Physical Review E*, Vol. 102, Issue 3, p. 033308 (2020), [2021 Impact Factor: 2.707].
- [12] Garuda Fujii* and Youhei Akimoto, Cloaking a concentrator in thermal conduction via topology optimization, International Journal of Heat and Mass Transfer, Vol. 159, p. 120082 (2020), [2021 Impact Factor: 5.431].
- [13] <u>Garuda Fujii</u>* and Youhei Akimoto, Optimizing the structural topology of bifunctional invisible cloak manipulating heat flux and direct current, *Applied Physics Letters*, Vol. 115, No. 17, p. 174101 (2019), [2021 Impact Factor: **3.791**].
- [14] <u>Garuda Fujii</u>^{*} and Youhei Akimoto, DC carpet cloak designed by topology optimization based on covariance matrix adaptation evolution strategy, *Optics Letters*, Vol. 44, Issue 8, pp. 2057–2060 (2019), [2020 Impact Factor: **3.714**].
- [15] Garuda Fujii* and Youhei Akimoto, Topology-optimized thermal carpet cloak expressed by an immersed-boundary level-set method via a covariance matrix adaptation evolution strategy, *International Journal of Heat and Mass Transfer*, Vol. 137, pp. 1312–1322 (2019), [2021 Impact Factor: 5.431].
- [16] Garuda Fujii*, Youhei Akimoto, and Masayuki Takahashi, Direct-current electric invisibility through topology optimization, *Journal of Applied Physics*, Vol. 123, Issue 23, p. 233102 (2018), [2021 Impact Factor: 2.546].
- [17] Masayuki Takahashi, Youhei Akimoto, Garuda Fujii^{*}, CMA-ES based topology optimization for acoustic cloak, Transactions of the JSME Vol.84, No.859, p.17-00590 (2018). (in Japanese)
- [18] Garuda Fujii^{*}, Youhei Akimoto, and Masayuki Takahashi, Exploring optimal topology of thermal cloaks by CMA-ES, *Applied Physics Letters*, Vol. 112, Issue 6, p. 061108 (2018), [2021 Impact Factor: **3.791**].
- [19] Garuda Fujii*, Masayuki Takahashi, and Youhei Akimoto, CMA-ES-based structural topology optimization using a level set boundary expression—Application to optical and carpet cloaks, *Computer Methods in Applied Mechanics and Engineering*, Vol. 332, pp. 624–643 (2018), [2021 Impact Factor: 6.588].

- [20] <u>Garuda Fujii</u>^{*} and Tsuyoshi Ueta, Topology-optimized carpet cloaks based on a level-set boundary expression, *Physical Review E*, Vol. 94, Issue 4, p. 043301 (2016), [2021 Impact Factor: **2.707**].
- [21] <u>Garuda Fujii</u>*, Tsuyoshi Ueta, Mamoru Mizuno, and Masayuki Nakamura, Topology-optimized multiple-disk resonators obtained using level set expression incorporating surface effects, *Optics Express*, Vol. 23, Issue 9, pp. 11312–11326 (2015), [2020 Impact Factor: **3.894**].
- [22] Tsuyoshi Ueta*, <u>Garuda Fujii</u>, Gen Morimoto, Kiyoshi Miyamoto, Akinori Kosaku, Takeo Kuriyama, and Takahiko Hariyama, Numerical study on the structural color of blue birds by a disordered porous photonic crystal model, *Europhysics Letters*, Vol. 107, No. 3, p. 34004 (2014), [2021 Impact Factor: 1.958, Selected as Editor's Choice].
- [23] <u>Garuda Fujii</u>*, Tsuyoshi Ueta, and Mamoru Mizuno, Level set-based topology optimization for anti-reflection surface, *Applied Physics A*, Vol. 116, Issue 3, pp. 921–927 (2014), [2020 Impact Factor: 2.584].
- [24] Junji Sakamoto, Takayuki Kato, <u>Garuda Fujii</u> and Masayuki Nakamura, Practical evaluations of the convenient identification method of metal material mechanical properties based on micro to milli indentation test—Applicability Verification by Applying Press Working Process—, Journal of JSEM Vol. 14, No. 4, pp. 264–270 (2014). (in Japanese)
- [25] Junji Sakamoto, <u>Garuda Fujii</u> and Masayuki Nakamura, A convenient identification method of metal material mechanical properties based on micro to milli indentation test, Journal of JSEM Vol. 14, No.4, pp. 257–263 (2014). (in Japanese)
- [26] <u>Garuda Fujii</u>*, Hayato Watanabe, Takayuki Yamada, Tsuyoshi Ueta, and Mamoru Mizuno, Level set based topology optimization for optical cloaks, *Applied Physics Letters*, Vol. 102, No. 25, p. 251106 (2013), [2021 Impact Factor: **3.791**].
- [27] Takayuki Yamada*, Hayato Watanabe, <u>Garuda Fujii</u>, and Toshiro Matsumoto, Topology optimization for a dielectric optical cloak based on an exact level set approach, *IEEE Transactions on Magnetics*, Vol. 49, No. 5, pp. 2073–2076 (2013), [2021 Impact Factor: **1.848**].
- [28] Garuda Fujii*, Toshiro Matsumoto, Toru Takahashi, and Tsuyoshi Ueta, Finite-element analysis of lasing modes within photonic random media, Journal of Physics B: Atomic, Molecular and Optical Physics, Vol. 45, No. 8, p. 085404 (2012), [2021 Impact Factor: 1.655, Featured as the Front Cover Image].
- [29] Garuda Fujii*, Toshiro Matsumoto, Toru Takahashi, and Tsuyoshi Ueta, Study on transition from photonic-crystal laser to random laser, *Optics Express*, Vol. 20, Issue 7, pp. 7300–7315 (2012), [2020 Impact Factor: **3.894**].
- [30] Garuda Fujii*, Toshiro Matsumoto, Toru Takahashi, and Tsuyoshi Ueta, A study on the effect of filling factor for laser action in dielectric random media, *Applied Physics A*, Vol. 107, Issue 1, pp. 35–42 (2012), [2020 Impact Factor: 2.584, Invited Paper].
- [31] Garuda Fujii*, Toshiro Matsumoto, Toru Takahashi, Takayuki Yamada, Tsuyoshi Ueta, Study on electric intensity dependency of laser action in randomly distributed dielectric rod, IEEJ Transactions on Electronics, Information and Systems, Vol. 132, pp. 89–95 (2012). (in Japanese)
- [32] Garuda Fujii*, Hitoshi Matsuda, Toshiro Matsumoto, Toru Takahashi, Takayuki Yamada, Tsuyoshi Ueta, Finite element analysis for laser action in honeycomb photonic crystals with random dangling bonds, Transactions of the Japan Society for Computational Methods in Engineering, Vol. 11, pp. 89–94 (2011). (in Japanese)

[33] <u>Garuda Fujii</u>^{*}, Toshiro Matsumoto, Toru Takahashi, Tsuyoshi Ueta, Finite element analysis for laser oscillation in random system consisting of heterogeneous dielectric materials, Transactions of the Japan Society for Computational Methods in Engineering, Vol. 10, pp. 117–122 (2010). (in Japanese)

Refereed Conference Papers:

- [34] Garuda Fujii*, Cloaking an object from both electromagnetic and acoustic waves via topology optimization, Proceedings of 15th International Congress on Artificial Materials for Novel Wave Phenomena (Metamaterials 2021), pp. 126–128 (2021), Talk No. MCPCA40804, Online (City University of New York), New York, USA, 20–25 September 2021, [Congress schedule was changed from August 2–7 to September 20–25.].
- [35] Garuda Fujii* and Masayuki Nakamura, Topology optimized design of carpet cloaks based on a level set approach, Proceedings of Optical Systems Design 2015: Computational Optics (SPIE: The International Society for Optics and Photonics), Vol. 9630, pp. 166–172 (96300U) (2015), Jena, Germany, 7–10, September 2015.
- [36] Garuda Fujii*, Tsuyoshi Ueta, Gen Morimoto, and Masayuki Nakamura, Numerical analysis for reflectance properties of bird-feather fibers, Proceedings of 8th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics (Metamaterials 2014), pp. 115–117 (2014), Technical University of Denmark, Copenhagen, Denmark, 25–30 August 2014.
- [37] Garuda Fujii*, Tsuyoshi Ueta, Mamoru Mizuno, and Masayuki Nakamura, Level set-based topology optimization for whispering gallery mode resonator circuits incorporating surface effects, *Proceedings of* 5th International Conference on Metamaterials, Photonic Crystals and Plasmonics (META 2014), pp. 182–186 (2014), Nanyang Technological University, Singapore, 20–23 May 2014.
- [38] Tsuyoshi Ueta*, Garuda Fujii, Gen Morimoto, Kiyoshi Miyamoto, and Akinori Kosaku, Numerical study on the structural color of blue birds by a disordered porous photonic crystal model, *Proceedings of* 5th International Conference on Metamaterials, Photonic Crystals and Plasmonics (META 2014), pp. 153–156 (2014), Nanyang Technological University, Singapore, 20–23 May 2014.
- [39] Garuda Fujii*, Tsuyoshi Ueta, and Mamoru Mizuno, Finite element analysis for laser action in random porous media, Proceedings of 7th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics (Metamaterials 2013), pp. 334–336 (2013).
- [40] Garuda Fujii*, Hayato Watanabe, Takayuki Yamada, Tsuyoshi Ueta, and Mamoru Mizuno, Level set based topology optimization for optical cloaks containing a large scattering object, *Proceedings of 10th* World Congress on Structural and Multidisciplinary Optimization (WCSMO10), p. 5283 (6 pages) (2013), Orlando, Florida, USA, 19–24 May 2013.
- [41] Mamoru Mizuno*, Atsushi Ogawa, and Garuda Fujii, Variation in thermal conductivity of CFRP plates due to impact damage, *Proceedings of 13th International Conference on Fracture (ICF-13)*, Vol. 5, pp. 3905–3910 (S42–003, 6 pages) (2013).
- [42] Garuda Fujii*, Tsuyoshi Ueta, and Mamoru Mizuno, Finite element analyses for random laser action in metallic disordered structures, *Proceedings of 6th International Congress on Advanced Electromagnetic Materials in Microwaves and Optics (Metamaterials 2012)*, pp. 758–760 (2012), St. Petersburg, Russia, 17–22 September 2012.
- [43] Shinya Harada, Akihisa Suzuki, Toru Takahashi, Takayuki Yamada^{*}, **Garuda Fujii**, and Toshiro Matsumoto, A level set-based topology optimization method for three-dimensional acoustic problems

using fast multipole boundary element method, *Proceedings of 9th World Congress on Structural and Multidisciplinary Optimization (WCSMO9)*, p. 059_1 (7 pages) (2011), Granship, Shizuoka, Japan, 13–17 June 2011.

[44] Garuda Fujii*, Toshiro Matsumoto, Toru Takahashi, and Tsuyoshi Ueta, A study on optical properties of photonic crystals consisting of hollow rods, *IOP Conference Series: Materials Science and Engineering*, Vol. 10, p. 012072 (10 pages) (2010), Sydney, Australia, 19–23 July 2010.

PROFESSIONAL ACTIVITIES

Editorial Activities:

Associate Editor Transactions of the JSME [Category: Design, Machine Element & Tribology, Information & Intelligent Tache close: Manufacturing, and Systems]	2025–Current (in Japanese)
Associate Editor Mechanical Engineering Journal [Category: Computational Mechanics]	2024–Current
Associate Editor Mechanical Engineering Letters [Category: Computational Mechanics]	2024–Current
Associate Editor Transactions of the JSME [Category: Computational Mechanics]	2024–Current (in Japanese)
Conference, Workshop, and Competition Organization:	
Coorganizer 12th World Congress on Computational Mechanics (WCCM XII) and AP- COM VI, (MS502) Advanced Simulation for Energy Harvesting and Convert- ing Metamaterial Devices	July 2016 Seoul, Korea
Invited Talks:	
Shape Design and Mathematics Symposium 2024 Realizing human-out-of-the-loop in topology optimization	September 2024 Tokyo, Japan
KSME-JSME Joint Symposium on Computational Mechanics & CAE 2024 Topology optimized-unfeelability metastructure generating tensile stress by external compressive load	September 2024 Tokyo, Japan
The 12th Symposium on Computational Mechanics Location camouflage through topology optimization	December 2022 Online
2022 International Conference on Thermodynamics and Thermal Metamaterials (ThermoMeta2022) Topology optimization for manipulating thermal waves in macroscale	August 2022 Online, China
2020 International Conference on Thermodynamics and Thermal Metamaterials (ThermoMeta2020) Thermal reversal-cloak via topology optimization	August 2020 Online, China
The 42nd PhotonIcs & Electromagnetics Research Symposium (PIERS) CMA-ES Based topology optimization for thermal-electrical bifunctional devices	December 2019 Xiamen, China

The 87th Symposium of Society for Science on Form
CMA-ES based topology optimization for cloak, camouflage and illusion
The 21st meeting of JSIAM Research activity group: Mathematical Design The basis of topology optimization and its recent developments
2017 Annual Congress of the Japan Society of Mechanical Engineers CMA-ES based topology optimization for cloak, camouflage and illusion
The 22th JASCOME Forum Study on low threshold random lasing

Reviewing:

Advanced Materials (Wiley) Advanced Functional Materials (Wiley) Advanced Theory and Simulations (Wiley) AIP Advances (AIP) Applied Physics Letters (AIP) Applied Thermal Engineering (Elsevier) Computer Methods in Applied Mechanics and Engineering (Elsevier) Engineering Analysis with Boundary Elements (Elsevier) Engineering Optimization (Taylor & Francis) Expert Systems With Applications (Elsevier) Finite Elements in Analysis & Design (Elsevier) IEEE Transactions on Evolutionary Computation (IEEE) International Journal of Heat and Mass Transfer (Elsevier) International Communications in Heat and Mass Transfer (Elsevier) iScience (Cell Press) Journal of Applied Physics (AIP) Laser & Photonics Reviews (Wiley) Materials Today (Elsevier) Materials Today Physics (Elsevier) Materials & Design (Elsevier) Nature Communications (Springer Nature) **Optics Express** (Optica) **Optics** Letters (Optica) Proceedings of the Royal Society A (Royal Society) Scientific Reports (Springer Nature) Thermal Science and Engineering Progress (Elsevier) Thin-Walled Structures (Elsevier) Transaction of JSME (JSME, in Japanese) Transactions of the Japan Society for Computational Methods in Engineering (JASCOME, in Japanese) Waves in Random and Complex Media (Taylor & Francis)

June 2019 Nagoya, Japan

December 2019 Tokyo, Japan

September 2017 Saitama, Japan

> March 2012 Nagoya, Japan

Skills

LANGUAGES

Computer Programming: Fortran, C++, etc.
Parallel Computing: MPI, OpneMP
Structural Analysis: Finite element method, etc.
Structural Modeling: Level set, Density

Japanese: Proficient (Native Speaker)

English: Advanced

– Paper Writing, Conference Talking

PROJECTS & GRANTS

See full list of projects on			
http://www.comput-mech.	<pre>shinshu-u.ac.jp/</pre>	~garudalab/html/g	grant_en.html

Grant-in-Aid for Scientific Research(B)	Grant No. 20H02053
tion to hyperelastic mechanical cloak	April 2020- March 2026
TAKEUCHI Scholarship Foundation	Grant No. takeuchi 2022-J-36
Mechanical unfeelability by topology optimization	April 2022- March 2023
TAKEUCHI Scholarship Foundation	Grant No. takeuchi 2020-J-12
"Reverse" of heat conduction: Development of topology optimization to real- ize thermal reversal metadevice	April 2020- March 2021
Grant-in-Aid for Young Scientists (B)	Grant No. 17K17778
Development of multi-phase topology optimization method using CMA-ES and its application to optical devices	April 2017- March 2020
Grant-in-Aid for Young Scientists (B)	Grant No. 26870239
Topology optimization for cloaking devices operating at multiple frequency	April 2014- March 2017
CASIO Science Promotion Foundation	Grant No. 18
Development of topology optimization method based on level set expression of optical device considering surface effect	January 2014- December 2014
The Mazda Foundation	Grant No. N/A
Development of topology optimization method for anti-reflection structure for windshield application	November 2012- October 2014
Grant-in-Aid for Research Activity Start-up	Grant No. 24860050
Level set-based topology optimization for optical cloaks	April 2012- March 2014

EXTRACURRICULAR ACTIVITIES

Times Higher Education World University Rankings -Invited to THE's Global Academic Reputation Survey 2022-Current