GUAN YIZHAO
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Research Interests: Autonomous driving, Sensor fusion, AI for intelligent vehicles, Computational imaging and sensing
Email: guanyizhaoian@gmail.com TEL: (081)080-2385-3768
Personal site: https://lgyz123.github.io/yizhao/cv/

RESEARCH & PROFESSIONAL EXPERIENCE

Software Developer, Bosch Japan (RBJP) *October 2024-Present*

- Perception developer for Autonomous Driving (ADAS), focusing on tracking of camera and radar fusion objects with the TrackToTrack method
- Performance evaluation on AEB scenarios and bring counter-measures to solve TP and FP problems
- Collaborated with international teams in Germany and Hungary on algorithm design, parameter tuning, and software testing.

Doctoral Researcher (Takahashi / Michihata lab) *Academic year 2019-2024*

- Member of JST CREST project on advanced precision measurement, developed deep-learning supported super-resolution microscopy aiming for ~10 nm optical imaging.
- Created phase-contrast microscopy system for ultra-sensitive nano-defect detection.
- Developed new depth measurement method based on FDTD/RCWA simulations for nanogrooves

Fine Nano- Mechanics (Miura ／ Suzuki lab) *Academic year 2017*

- Ab initio simulation for Graphene

Fluid Dynamic (Ohnish Lab) *Fall Semester 2016*

- Simulation of the airflow around the wing under applied laser beam and analyses lift improvement.

EDUCATION

Ph.D. in Precision Engineering , The University of Tokyo *October 2021 - September 2024*

- Dissertation: " Super-Resolution Evaluation for the Realization of Microstructured Optical Functional Devices"

M.Eng. in Precision Engineering, The University of Tokyo *October 2019 - September 2021*

- Thesis: " Dark-field non-invasive depth measurement for super-fine periodic microgrooves based on near-field polarization analysis"

B.Eng. in Tohoku University *October 2015 - September 2019*

RESEARCH ACHIEVEMENTS

Peer-Reviewed Journal Articles (First Author)

1. Yizhao Guan, Shuzo Masui, Shotaro Kadoya, Masaki Michihata and Satoru Takahashi, “Super-resolution Imaging of Sub-diffraction-limited Pattern with Superlens based on Deep Learning”, International Journal of Precision Engineering and Manufacturing (IJPEM), Volume 25, pages 1783–1792, (2024)
2. Yizhao Guan, Shuzo Masui, Shotaro Kadoya, Masaki Michihata and Satoru Takahashi, “Super-resolution by Localized Plasmonic Structured Illumination Microscopy using Self-Assembled Nanoparticle Substrates”, Nanomanufacturing and Metrology, Volume 7, article number 14, (2024)
3. Yizhao Guan, Shuzo Masui, Shotaro Kadoya, Masaki Michihata and Satoru Takahashi, “Smart optical measurement probe for autonomously detecting nano-defects on bare semiconductor wafer surface: highly sensitive observation system using phase-contrast microscopy with a spatial light modulator”, 2022 J. Phys.: Conf. Ser. 2368 012014.
4. Yizhao Guan, Shotaro Kadoya, Masaki Michihata, Satoru Takahashi, “The FDTD analysis for dark field in-process depth measurements of fine microgrooves”, Measurement: sensors, Volume 18, 2021, 100257.
5. Yizhao Guan, Hiromasa Kume, Shotaro Kadoya, Masaki Michihata and Satoru Takahashi, “The FDTD analysis of near-field response for microgroove structure with standing wave illumination for the realization of coherent structured illumination microscopy”, Journal of Manufacturing Science and Engineering, Vol. 144, Issue 3 (2022) 031004.

Conference Presentations

6. Manufacturing Science and Engineering Conference (MSEC 2021) *March 2021*
   The FDTD Analysis of near-field response for microgroove structure with standing-wave illumination for the realization of coherent structured illumination microscopy (Selected and Published in Journal of Manufacturing Science and Engineering)
7. OPTICS & PHOTONICS International Congress (OPIC 2021) *April 2021*
   The FDTD Analysis for Diffraction Limited Microgroove Structure with standing-wave illumination for the realization of coherent structured illumination microscopy
8. International Measurement Confederation (IMEKO 2021) *August 2021*
   The FDTD Analysis for Dark Field In-process Depth Measurements of Fine Microgrooves (Selected and Published in Measurement: Sensors)

9. The 11th Global Conference on Materials Science and Engineering (CMSE 2022) *September 2022*
   Smart optical measurement probe for autonomously detecting nano-defects on bare semiconductor wafer surface: highly sensitive observation system using phase-contrast microscopy with a spatial light modulator (Selected and Published in Journal of Physics: Conference Series)
10. Asian Society for Precision Engineering and Nanotechnology (ASPEN 2022) *November 2022*
    Optical Depth Measurement for Microgrooves: A Self-interferometry Method based on Near-field Polarization Analysis (**Best Paper Award**)
11. Leading Edge Manufacturing/Material and Processing (LEM&P) *June 2023*
    Numerical simulation of self-assembled nanoparticles substrate for plasmonic structured illumination microscopy
12. International Symposium on Measurement Technology and Intelligent Instruments (ISMTII) *September 2023*
    Super-resolution Imaging of Sub-diffraction-limited Pattern with Superlens based on Deep Learning (**Best Paper Award**)

FELLOWSHIPS & AWARDS

- 2024 Outstanding graduation thesis award (Doctoral)
- JSPS DC1 (2022-2024)
- Best Paper Award for ASPEN 2022
- Best Paper Award for ISMTII 2023
- Scholarship from Sumitomo Electric Industries Social Contribution Foundation
- Outstanding mater thesis award
- Tohoku University Honor President Fellowship
- The Monbukagakusho Honors Scholarship (JASSO)

TEAM WORKS

Track2track developer for one-driving ADAS system *2024-*

- Co-work with German and Hungarian colleagues in algorithm development, contribution to fusion parameter turning and software tests.

JST Research program Core Research for Evolutionary Science and Technology *2022-2024*

- This research target is to develop outstanding evolution of advanced precision measurement using measurement standards and information science: Development of 10nm super-resolution optical loupe. Three teams from Tokyo University and AIST co-work together.

Professional development Consortium for Computational Materials Scientists (PCoMS) *September 2018*

- In this seminar, the topic "Computer-based DFT (Density functional theory) simulation for corrosion resistance of aluminum" was proposed by our team. I did the final presentation while team members (an assistant professor and a doctoral student) combined their ideas.

Team-based Research *Fall semester 2016*

- We proposed a line navigation robot and realized this idea using Robolab. I participated in the assembling and programming.

INTERNSHIPS

Sony Group *February 2023*

- R&D department, Tokyo, Optimization of grating coupler using FDTD

Mazda Motor Corporation *September 2019*

- R&D department, Hiroshima, Learning the jointing technology development of different metals

SKILLS

- Experiments Optical microscopy, Interferometry, Ellipsometry, Scanning-electron microscopy, Atomic force microscopy, Sputter deposition, Electron beam lithography, Dry etching.
- Software Github, C/C++, Python, Matlab, Comsol, Solid works (Design software), Blender, ab initio simulations
- Language Native Chinese, Fluent in English (GRE 324) and Japanese (JLPT N1 level).

REFERENCES

1. Prof. Satoru Takahashi
Professor, Precision Engineering, The University of Tokyo
Email: takahashi@nanolab.t.u-tokyo.ac.jp
PhD advisor

2. Prof. Masaki Michihata
Associate Professor, Precision Engineering, The University of Tokyo
Email: michihata@nanolab.t.u-tokyo.ac.jp
Co-advisor / collaborator