GUAN YIZHAO
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EDUCATION

The University of Tokyo *October 2021 - September 2024 (expected)*
- Doctor degree in Precision Engineering. (In Japanese)

The University of Tokyo *October 2019 - September 2021*
- Master degree in Precision Engineering. (In Japanese)

Tohoku University *October 2015 - September 2019*
- Undergraduate degree in Mechanical and Aerospace Engineering (IMAC Program, an international course taught in English).

High School Afflicted to China Fudan University *September 2012 - August 2015*

RESEARCH EXPERIENCE

(Work with professors and doctors as several international groups from Japan, British, India, Indonesia, Thai, etc.)

Fluid Dynamic (Ohnish Lab) *Fall Semester 2016*
- Simulation of the airflow around the wing under applied laser beam and analyses lift improvement.

Fine Nano- Mechanics (Miura / Suzuki lab)Academic year 2017
- Ab initio simulation for Graphene

Optical super-resolution (Takahashi / Michihata lab) *Academic year 2019-2024*
- FDTD and RCWA simulation for super-resolution microscopy
- Study of super-resolution optical depth measurement
- Development of ultra-sensitive surface particle detection method with phase-contrast microscopy
- Development of super-resolution microscopy aims at 10 nm resolution.

Participate in a research project on JST Research program CREST (Satoru Takahashi Team)

RESEARCH ACHIEVEMENTS

FIRST AUTHOR PAPER

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), (Accepted)
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, (Accepted)
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.

FIRST AUTHOR INTERNATIONAL CONFERENCES

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)

FIRST AUTHOR CONFERENCES IN JAPAN

1. Japan Society of Mechanical Engineers (JSME) Tohoku *September 2018*
First Principle Calculation on the Electrical Conductivity of Dumbbell-shape Graphene Nano-Ribbon.
2. Japan Society of Mechanical Engineers Computational Mechanics Division (CMD) *September 2019*
Effect of Strain on the Gas Adsorption of Graphene: A First Principle Study
3. The Japan Society for Precision Engineering (JSPE) *September 2020*
The FDTD Analysis of Near-field Response for Microgroove Structure with Standing Wave Illumination
4. The Japan Society for Precision Engineering (JSPE) *March 2021*
The FDTD Analysis of Near-field Response for Microgroove Structure with Standing Wave Illumination (2nd) -The Relationship of Microgroove Depth and Near-field Phase Response
5. Optics & Photonics Japan (OPJ) *September 2020*
Optical FDTD Analysis of Surface Microstructure for Coherent Structured Illumination Microscopy
6. The Japan Society for Precision Engineering (JSPE) *March 2022*
Near-field Phase Analysis of Periodic Microgroove Structure for Metasurface Design based on FDTD Simulation
7. The Japan Society for Precision Engineering (JSPE) *March 2022*
Study on the Detection of Nanoscale Foreign Objects by Autonomous Defect Exploration and Split-Type Multi-Probe (Report 11) - High Sensitivity Detection of Liquid Phase Probes by Spatial Optical Phase Modulation (In Japanese)

TEAM WORKS

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.

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.

JST Research program Core Research for Evolutionary Science and Technology *Since 2022*

- 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.

PART-TIME JOBS

Convenient store (Ministop Co., Ltd.) staff *September 2017 - October 2018*

- Be promoted from C level to A level staff in 3 months.

Freshman tutor *October 2017 - August 2018*

- Support a new international student from Singapore in his study and daily life.

Internship

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 & INTERESTS

- Experiments Optical microscopy, Interferometry, Ellipsometry, Scanning-electron microscopy, Atomic force microscopy, Sputter deposition, Electron beam lithography, Dry etching.
- Software Microsoft Office, C Language, Python, Matlab, Solid works (Design software), Blender.
- Language Native Chinese, Fluent in English (GRE 324) and Japanese (JLPT N1 level).
- Interests Running, Simulation Games, Taichi (Martial Arts), Badminton

Academic Achievements & Honors

- MSEC 2021 selected for publication
- IMEKO 2021 selected for publication
- CMSE 2022 selected for publication
- Best Paper Award for ASPEN 2022
- Best Paper Award for ISMTII 2023

Personal Achievements & Honors

- JSPS DC1 (2022-2024)
- Letter of thanks for attendance of EUSPEN Talent Program 2022
- Outstanding graduation thesis award（修士論文優秀賞）
- Graduation GPA: 2.7/3
- Scholarship from Sumitomo Electric Industries Social Contribution Foundation
- Finish undergraduate graduation courses in the 6th semester (normally 8th semester), and start taking graduate school lectures.
- Undergraduation GPA: 3.34/4　Core courses: Obtain AA (GPA=4) in lectures below:
  Heat Transfer (I,II)，Control Engineering (I,II), Quantum Mechanics, Computer seminar.
- Tohoku University Honor President Fellowship.
- The Monbukagakusho Honors Scholarship (JASSO).
- Membership of The Japan Society of Mechanical Engineers.
- Enrolled in "elite training program" a study tour in Zhangye High school, Gansu, China.
- Participated in voluntary support education in Xiji, Ningxia, China.