

Sahil Sharma

Marie Skłodowska-Curie Postdoctoral European Fellow, Ultrasound and Biosensor Researcher

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A PhD in Physical Sciences, specializing in ultrasound technology and biosensors. Proven expertise in designing and developing neural recording instrumentation and biomedical devices. Adept at working on complex projects and collaborating with multidisciplinary teams.

Research Experience

Marie Curie Postdoctoral European Fellowship (*European Commission*), SonoNeuroS project
Jan 2023 - Present

- Designed neural recording instrumentation setup for PMUT connected with a microelectrode array.
- Trained in microelectrode array design and PMUT fabrication in a cleanroom.
- Study of cell-culture bio-design setup under the microscope, handling PMUTs.

Post-Doctoral Researcher *Grenoble Institute of Neurosciences, INSERM-U1216*
Jan 2021 - Jan 2023

- THE NEURAL SOUND project to develop fully wireless recording technology.
- Designed hardware instrumentation and software in Python for data acquisition and analysis.
- Improved data processing efficiency by implementing new analytical frameworks.

Senior Research Fellow (SRF): National Physical Laboratory, Delhi, India.
(Aug. 2017 - Aug 2020),

- Design of GUI with data acquisition with LabVIEW, and embedded C/C++. Measurement of ultrasonic power by Primary Radiation Force Balance (RFB) technique.
- Development of an *ultrasonic excitation system*, with a wide range of *radio frequency excitation and novel detection techniques* with signal conditioning.
- Variable frequency ultrasonic interferometer with improved fixed path liquid cell.

Junior Research Fellow (JRF 2-years): National Physical Laboratory, Delhi, India.
(Aug. 2015 -Aug. 2017)

- Improvement in ultrasonic interferometer for *liquid characterization and spectroscopic analysis* of liquids.
- Design of customized embedded RF excitation source based on Direct digital synthesis technique for interferometer applications.

Education

Jan 2015 - Dec 2020

Doctor of Philosophy (PhD), Physical Sciences (Instrumentation, Electronics)
CSIR-National Physical Laboratory, Academy of Scientific and Innovative Research, New Delhi, India
Thesis "Design, Development and Analysis of Instrumentation for Ultrasonic Characterization of Liquids" Research advisor: Dr. PK Dubey.

Jan 2012 - Dec 2014

Master's Degree in Electronics
University of Jammu, Jammu Tawi
Thesis: "Impact of Chirality on Single-Walled CNT Parameter for Device Application."
Project Title "Embedded System and its Applications using MSP430." Thesis Supervisor: Prof. Rakesh Vaid

Jan 2009 - Dec 2012

Bachelor's Degree in Science, (Electronic, Physics and Mathematics)
University of Jammu, Jammu Tawi

Employment

Mar 2024 - Present

Visiting Researcher- (Secondment) Marie Skłodowska-Curie Actions
ESIEE PARIS, Paris, Île-de-France, France · On-site
Laboratory ESYCOM UMR 9007 (CNRS)

Jan 2023 - Present

Marie Skłodowska-Curie Postdoctoral Fellow
Grenoble Institut Neurosciences, On-site

Jan 2021 - Jan 2023

Postdoctoral Researcher at NeuroTech Lab, INSERM
Grenoble Institut Neurosciences

Aug 2015 - Oct 2020

Ultrasonic Instrumentation (Metrology)
National Physical Laboratory, New Delhi Area, India

Jun 2013 - Jul 2013

Industrial Training on Embedded System
RS Power Systems - India, Jaipur Area, India

Patents, Research publications and Industrial Contributions

Patents:
1. Clement Hebert, **Sahil Sharma**, Carole-Anne Lernoud and Bruno Fain, "*Ultrasound-based wireless battery-free implantable sensors comprising a solution-gated field-effect transistor*", **European Patent**, Application No: **EP22305631.8**, 28th April 2022 (filed).
2. P K Dubey and **Sahil Sharma**, "*Improved Ultrasonic Interferometer Excitation and Detection Device for Velocity and Attenuation Measurement*", **Indian Patent**, Application No: **201711036499**, 14 June 2019 (Published).

INDUSTRIAL INNOVATION: Transferred to *M/s Physics Instruments Company (PICO)*, Chennai, on 18th Feb

I consent to the processing of my personal data for the purpose of recruitment for the position to which I am applying.

SCI PUBLICATIONS: (* corresponding author, #equal)

1. **S Sharma***, C A Lernoud, B Fain, R Othmen, V Bouchiat, B Yvert, and C Hébert* "Flexible Graphene Solution-Gated Field-Effect Transistor for Ultrasound-Based Wireless and Battery-Free Biosensing", **Advanced material technologies, Wiley VCH, 2023.** <https://doi.org/10.1002/admt.202300163>
2. N Dhiman; **S Sharma**, Piyush, B Kumar, S Yadav and P. K. Dubey, *Development of sweep frequency ultrasonic interferometer for high precision velocity measurement in liquids* **Review of Scientific Instruments, American Institute of Physics, AIP, 2023**
3. S Golemati, S Shah, and **S Sharma#**, Triple SONOS: Continuous monitoring of cardiac output using capacitive/Piezo micromachined ultrasound transducer, **American Society of Echocardiography, Echo vol 11 Issue 9, 2022** <https://www.asecho.org/wp-content/uploads/2022/09/Echo-Magazine-September-2022-FINAL.pdf>
4. D Yadav, M Singh, **S Sharma**, S P Singh, and P K Dubey, Dual Wavelength based Approach with Partial Least Square Regression for the Prediction of Glucose Concentration, **Indian Journal of Pure & Applied Physics Vol. 60, 2022,**
5. **S Sharma***, U K Mishra, S Yadav, and P K Dubey, Improved ultrasonic interferometer technique for propagation velocity and attenuation measurement in liquids, **Review of Scientific Instruments, American Institute of Physics, AIP, 2019** <https://doi.org/10.1063/1.5088762>
6. **S Sharma***, U K Mishra, A K Saini, and P K Dubey, *Accuracy estimation of propagation velocity in variable path ultrasonic interferometer for liquids*", **MAPAN- J. Met. Soc. India, Springer, 2019 DOI: 10.1007/s12647-019-00331-x**
7. **S Sharma***, S Yadav and P K Dubey, *Continuous-wave ultrasonic interferometers with relatively higher excitation power are inappropriate for liquid characterization*", **MAPAN- J. Met. Soc. India, Springer, 2020. DOI: 10.1007/s12647-020-00389-y**

INVITED SPEAKER

-National Workshop/Seminar " Role of ultrasound in Medical domain", Legal Metrology, Govt. of India, June 2024.
-Testimonials talk on International Postdoctoral Fellowships MSCA, INSERM, Institute for Advanced Biosciences, Grenoble, Feb 2024.

(Invited: 2, Oral : 3 & Poster: 5)

CONFERENCE PAPERS

1. ***S Sharma**, K Yadav, S Yadav and P K Dubey, "Advantages of direct digital synthesis based technique for frequency sweep ultrasonic interferometry", 6th National Conference on Advances in Metrology. **2020 (Oral Presentation)**
2. ***S Sharma**, A K Saini, U K Mishra, and P K Dubey, "Effect of liquid sample holder structure on ultrasonic attenuation and velocity measurement", 10th International Conference on Advances in Metrology. **2019 (Poster)**
3. ***S Sharma**, S Yadav, and P K Dubey, "Optically coupled real-time heart rate measurement system with improved resolution and sensitivity", 13th International Conference on Western Pacific Acoustics Conference (WESPAC). **2018 Oral Presentation)**
4. ***S Sharma**, U K Mishra, A K Saini, and P K Dubey, "Comparative study of ultrasonic propagation velocity by using pulse-echo and interferometer technique", National symposium on instrumentation (NSI-41), JSS Science and Technology University, India. **2018 (Oral Presentation)**
5. ***S Sharma** and P K Dubey, "Issues in ultrasonic attenuation measurement with the pulse-echo method in liquids", 5th National Conference on Advances in Metrology, The North Caps University, India **2017 (Poster)**
6. ***K Yadav, S Sharma**, S Yadav, and P K Dubey, "Study and analysis of wide frequency ultrasonic time of flight measurement in reference rod", 6th National Conference on Advances in Metrology **2020 (Poster)**
7. A K Saini, ***S Sharma**, U K Mishra, and P K Dubey, "Improved software based envelope detection method for ultrasonic C-scan system", 10th International Conference on Advances in Metrology. **2019 (Poster)**
8. ***K Yadav, S Sharma**, Sanjay Yadav, and P K Dubey, "Effect of temperature variations in ultrasonic dimensional Metrology", 10th International Conference on "Advances in Metrology. **2019 (Poster)**
9. Ujjwal K Mishra, ***S Sharma**, A K Saini, and P K Dubey, "Effect of rf burst excitation delay in pulsed electromagnetic EMAT", 10th International Conference on "Advances in Metrology, **2019. (Poster)**
10. ***A K Saini, S Sharma**, U K Mishra, and P K Dubey, "Uncertainty estimation in thickness measurement using ultrasonic pulse-echo technique", National Symposium on Instrumentation (NSI-41), JSS Science and Technology University India. **2018 (Oral Presentation)**
11. ***N Dhiman, S Yadav, S Sharma**, Piyush, and P K Dubey, "Estimation of thermal conductivity of liquids using CSIR-NPL indigenously developed ultrasonic interferometer", 6th National Conference on Advances in Metrology. **2020 (Poster)**
12. ***Piyush, N Dhiman, S Yadav, S Sharma**, B Kumar, Abhilasha, K Yadav and P K Dubey, "Modern technologies for ultrasonic non-destructive evaluation of concrete structure" 6th National Conference on Advances in Metrology. **2020 (Poster)**
13. ***B Kumar, Piyush, N Dhiman, S Yadav, S Sharma**, Abhilasha, K Yadav and P K Dubey, "Polarized shear wave electromagnetic acoustic transducer (EMAT) for ultrasonic non-destructive", 6th National Conference on Advances in Metrology. **2020 (Poster)**
14. ***U K Mishra, A K Saini, S Sharma**, and P K Dubey, "Electromagnetic acoustic transducer based thickness measurement and comparison with conventional piezoelectric contact method", National Symposium on Instrumentation (NSI-41), JSS Science and Technology University India. **2018 (Oral Presentation)**
15. P K Dubey, S Singh, and ***S Sharma**, "High-resolution transducer-target separation and measurement system with laser feedback", 4th National Conference on Innovation in Indian Science, Engineering & Technology, **2017 (Poster)**

Management Skill

• **Organizing Committee (Diversity and Inclusion Chair), IEEE, International Ultrasound Symposium (IUS 2022),, Venice, Italy**

• **Organising event, India International Science Festival (IIFS)-2016 CSIR-National Physical Laboratory, New Delhi India**

Technical Skills:

Ultrasound Technology

Microelectrode Array Design

Electrochemical standard mechanisms (CV, EIS)

Instrumentation

Cleanroom environment (Photolithography, RF/DC Sputtering, wet/dry Etching)

Neural Implants design

Skills

Research Skills:

- Experimental Design
- Data Acquisition and Analysis Scientific
- Writing and Publishing
- Project Management

Software knowledge

- Anaconda (Spider)
- Kicad PCB Design
- K-layout design,
- Origin,
- Visual Studio,
- MS Office

Programming Languages:

- Python (Data Analysis, Machine Learning)
- MATLAB (Signal Processing)
- LabVIEW (Instrumentation Control)
- C/C++ (microcontroller, Embedded)

Ongoing Skill: •

- Micro-fabrication and materials fabrication
- Bio-sensing and handling of a biological sample.

Professional Interests:

- Attending industry conferences
- Networking with professionals in biomedical engineering
- Reading up on the latest technological advancements in the field

Conferences (National/International)

- Advances in Metrology, India
- Instrumentation Society, India
- International Ultrasound Symposium 2022
- Western Pacific Acoustics Conference (WESPAC)

Journal reviewer

■ Review of Scientific Instruemtation (RSI)
American institute of physics,

■ Measurement Elsevier

■ SN Applied Sciences

Language and Hobby

English

Hindi

French

Music and Hiking

References

1) **Dr. Sanjay Yadav** (Former Chief Scientist & Head, Doctoral Advisory)
Editor in Chief, Mapan Journal, Elsevier.
National Physical Laboratory, New
Delhi, India.
Email: ysanjay62@gmail.com, Phone: +
91-9868228854

2) **Dr. Clement Hebert** (Team Lead & Researcher Supervisor)
Wireless neural implants,
Grenoble institute of neurosciences,
Inserm U1216, France
Email: clement.hebert@inserm.fr, Phone:
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3) **Dr. P K Dubey** (Senior Principal Scientist & PHD Supervisor)
National Physical Laboratory,
New Delhi, India.
Email: premkdubey@gmail.com,
dubeypk@nplindia.org