

# CURRICULUM-VITAE

## DR. SANTOSH KUMAR

### Professor

**SPIE FELLOW, Senior Member (IEEE, OPTICA, SPIE)**

**2022 Best Associate Editor of IEEE Sensors Journal**

Associate Editor, IEEE Sensors Journal

Associate Editor, Biomedical Optics Express

Associate Editor, IEEE Internet of Things

Chair - Optical Biosensors Optica Technical Group

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## ACADEMIC RECORDS

Degree	Specialization / Discipline	College/University/Institute	Year of Joining	Year of leaving
10 <sup>th</sup> /Matric	Science	Bihar Secondary Education Board, Patna	2000	2002
12 <sup>th</sup> /Inter	Science	Bihar Intermediate Education Council, Patna	2002	2004
B. E. (Bachelor of Engineering)	Electronics & Comm. Engineering	M.I.T, Aurangabad, Maharashtra, India	2006	2010
<b>Ph. D (Full Time) (Doctor of Philosophy)</b>	<b>Electronics Engineering</b>	<b>Indian Institute of Technology (ISM), Dhanbad, India</b>	<b>2011</b>	<b>2014</b>

## WORK EXPERIENCE

Details of Employment / Work Experience					
Position held	Organization/Institute	Date of Joining	Date of Leaving	Total Period	
				Years	Months
<b>Assistant Professor</b>	<b>DIT University, Dehradun, India</b>	01 July 2014	31 May 2018	03	11
<b>Associate Professor</b>	<b>Liaocheng University, Liaocheng, China</b>	25 June 2018	31 Dec 2022	04	06
<b>Professor</b>	<b>Liaocheng University,</b>	01 Jan. 2023	(Upto Aug.	00	08

	Liaocheng, China		2023)		
			Continued		

## ABOUT MY Ph.D

Ph.D. Title: **Study of Optical Waveguides and Switching Devices**

Research area of Ph.D. work: **Optical Fiber Communication**

Date of Award: **10 October 2014**

Name of Ph.D Supervisor: **Dr. Sanjeev Kumar Raghuwanshi**  
Associate Professor, Department of Electronics Engineering,  
Indian Institute of Technology (ISM), Dhanbad, Jharkhand, India

## LIST OF PUBLICATIONS

[Scopus Author ID: 36065677600](#)

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[Web of Science ResearcherID: J-7408-2013](#)

**Google Scholar Profile:** <https://scholar.google.co.in/citations?user=squujIAAAAJ&hl=en>

**SPIE Author Profile:** <https://spie.org/profile/santoshrus-05021987?SSO=1>

**As per Scopus Preview:** <https://www.scopus.com/authid/detail.uri?authorId=36065677600>

**As per Web of Science Preview:** <https://www.webofscience.com/wos/author/record/609748>

# Kumar, Santosh

📍 Liaocheng University, Liaocheng, China
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Profile summary

- 298** Total documents
- 245** Web of Science Core Collection publications
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- 1751** Verified peer reviews
- 510** Verified editor records

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**245**

Publications in  
Web of Science

## Summary of International Journals

IEEE/IEEE Transactions	Optica (Formerly OSA)	Elsevier	Springer	SPIE	Others	Total
65	42	43	30	10	40	230

#### Summary of International Conferences

IEEE	Optica (Formerly OSA)	SPIE	PIERS	Total
10	18	46	3	77

## RECENT HIGH-LEVEL MAJOR PUBLICATIONS

#### \*Corresponding author

- [1]. Ragini Singh, Zhi Wang, Carlos Marques, Rui Min, Bingyuan Zhang, **Santosh Kumar\***, "Alanine aminotransferase detection using TIT assisted four tapered fiber structure-based LSPR sensor: From healthcare to marine life," *Biosensors and Bioelectronics*, Vol. 236, 115424 (23 May 2023). DOI: <https://doi.org/10.1016/j.bios.2023.115424> (Impact Factor: 12.545)
- [2]. Ragini Singh, **Santosh Kumar\***, Feng-Zhen Liu, Cheng Shuang, Bingyuan Zhang, Rajan Jha, Brajesh Kumar Kaushik, "Etched multicore fiber sensor using copper oxide and gold nanoparticles decorated graphene oxide structure for cancer cells detection," *Biosensors and Bioelectronics*, Vol. 168, 112557 (26 Aug. 2020) DOI: <https://doi.org/10.1016/j.bios.2020.112557> (Impact Factor: 12.545)
- [3]. Baljinder Kaur, **Santosh Kumar\***, B. K. Kaushik, "Recent advancements in optical biosensors for cancer detection," *Biosensors and Bioelectronics*, Vol. 197, 113805 (15 Nov. 2021) (Impact Factor: 12.545). DOI: <https://doi.org/10.1016/j.bios.2021.113805>
- [4]. **Santosh Kumar\***, Yu Wang, Muyang Li, Qinglin Wang, S. Malathi, Carlos Marques, Ragini Singh, Bingyuan Zhang, "Plasmon-based Tapered-in-Tapered Fiber Structure for p-Cresol Detection: from Human Healthcare to Aquaculture Application," *IEEE Sensors Journal*, Vol. 22, Issue 19, pp. 18493 - 18500 (25 August 2022) DOI: 10.1109/JSEN.2022.3200055 (Impact Factor: 4.325)
- [5]. Wen Zhang, Ragini Singh, Zhi Wang, Guoru Li, Yiyan Xie, Rajan Jha, Carlos Marques, Bingyuan Zhang, and **Santosh Kumar\***, "Humanoid shaped optical fiber plasmon biosensor functionalized with graphene oxide/multi-walled carbon nanotubes for histamine detection," *Optics Express*, Vol. 31, Issue 7, pp. 11788-11803 (23 March 2023) (Impact Factor: 3.894). DOI: <https://doi.org/10.1364/OE.486844>
- [6]. Guoru Li, Ragini Singh, Jiajun Guo, Bingyuan Zhang, and **Santosh Kumar\***, "Nb<sub>2</sub>CT<sub>x</sub> MXene-assisted double S-tapered fiber-based LSPR sensor with improved features for tyramine detection," *Applied Physics Letters*, Vol. 122, p. 083701 (23 Feb., 2023) (Impact Factor: 3.971) DOI: <https://doi.org/10.1063/5.0143776>
- [7]. **Santosh Kumar\***, Guo Zhu, Ragini Singh, Qinglin Wang, Cheng Shuang, Bingyuan Zhang, Feng-Zhen Liu, Carlos Marques, Brajesh Kumar Kaushik, Rajan Jha, "MoS<sub>2</sub> Functionalized Multicore Fiber based on Localized Plasmon for Detection of Shigella Bacteria," *IEEE/OPTICA Journal of Lightwave Technology*, Vol. 39, Issue 12, 4069 – 4081, 9 Nov. 2020, DOI: 10.1109/JLT.2020.3036610 (Impact Factor: 4.288).
- [8]. **Santosh Kumar\***, Ragini Singh, Qingshan Yang, Shuang Cheng, Bingyuan Zhang, Brajesh Kumar Kaushik, "Highly sensitive, selective and portable sensor probe using germanium-doped photosensitive optical fiber for ascorbic acid detection," *IEEE Sensors Journal*, Vol. 21, Issue 1, pp. 62-70, 12 February 2020, DOI: [10.1109/JSEN.2020.2973579](https://doi.org/10.1109/JSEN.2020.2973579) (Impact Factor: 4.325).

- [9]. **Santosh Kumar\***, Ragini Singh, Brajesh Kumar Kaushik, Nan-Kuang Chen, Qing Shan Yang, Xia Zhang, "LSPR based cholesterol biosensor using hollow core fiber structure," *IEEE Sensors Journal*, Vol. 19, No. 17, 7399-7406, 15 May 2019. **(Impact Factor: 4.325)**
- [10]. **Santosh Kumar\***, Brajesh Kumar Kaushik, Ragini Singh, Nan-Kuang Chen, Qing Shan Yang, Xia Zhang, Wenjun Wang, Bingyuan Zhang, "LSPR based cholesterol biosensor using tapered optical fiber structure," *Biomedical Optics Express*, Vol. 10, No. 5, pp. 2150-2160, 2 April 2019 **(Impact Factor: 3.921)**
- [11]. **Santosh Kumar\***, Ragini Singh, Guo Zhu, Qingshan Yang, Xia Zhang, Shuang Cheng, Bingyuan Zhang, Brajesh Kumar Kaushik, Feng-Zhen Liu, "Development of uric acid biosensor using gold nanoparticles and graphene oxide functionalized micro-ball fiber sensor probe," *IEEE Transactions on NanoBioscience*, Vol. 19, Issue 2, pp. 173-182, 10 December 2019 **(Impact Factor: 3.206)**.
- [12]. Baljinder Kaur, **Santosh Kumar\***, Brajesh Kumar Kaushik, "(INVITED) Advances in photonic crystal fiber: sensing and supercontinuum generation applications," *Optical Fiber Technology*, Vol. 72, 102982, (16 July 2022) (Impact Factor: 2.8) DOI: <https://doi.org/10.1016/j.yofte.2022.102982> **[Invited Paper]**
- [13]. Niteshkumar Agrawal, Bingyuan Zhang, Chinmoy Saha, Chandrakanta Kumar, Xipeng Pu, **Santosh Kumar\***, "Ultra-sensitive cholesterol sensor using gold and zinc-oxide nanoparticles immobilized core mismatch MPM/SPS probe," *IEEE/OPTICA Journal of Lightwave Technology*, Vol. 38, Issue 8, pp. 2523-2529, 18 February 2020 **(Impact Factor: 4.288)**.
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- [17]. Xuecheng Liu, Ragini Singh, Guoru Li, Carlos Marques, Bingyuan Zhang, **Santosh Kumar\***, "WaveFlex Biosensor-using Novel Tri-Tapered in Tapered Four-Core Fiber with Multimode Fiber Coupling for Detection of Aflatoxin B1," *IEEE/OPTICA Journal of Lightwave Technology*, pp. 1-10 (2 August 2023) DOI: 10.1109/JLT.2023.3301069 (Impact Factor: 4.288).
- [18]. R. Singh, A. Sharma, J. Saji, A. Umapathi, **Santosh Kumar**, H. K. Daima, "Smart nanomaterials for cancer diagnosis and treatment," *Nano Convergence*, Vol. 9, Article number: 21 (15 May 2022) (Impact Factor: 8.56). DOI: <https://doi.org/10.1186/s40580-022-00313-x>
- [19]. Baljinder Kaur, **Santosh Kumar\***, Brajesh Kumar Kaushik, "2D Materials based Fiber Optic SPR Biosensor for Cancer Detection at 1550 nm," *IEEE Sensors Journal*, Vol. 21, No. 21, 23957 – 23964, 07 Sept. 2021. **(Impact Factor: 4.325)**.
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- [55]. P. S. Pandey, S. K. Raghuwanshi, A. Shadab, Md. T. I. Ansari, U. K. Tiwari, and **Santosh Kumar\***, "SPR Based Biosensing Chip for COVID-19 Diagnosis - A Review," *IEEE Sensors Journal*, Vol. 22, Issue 14, pp. 13800 - 13810 (14 June 2022) DOI: 10.1109/JSEN.2022.3181423 (Impact Factor: 4.325)
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## PATENT

**Patent:** An IoT monitoring system for underground mines using a fiber Bragg grating chemical sensor

**Inventors:** S. K Raghuvanshi, Y. Singh, P. S. Pandey, M. Singh, **Santosh Kumar**, A. Shadab, R. Kumar, Md T. I. Ansari

**Web:** <https://ipindiaservices.gov.in/PublicSearch/PublicationSearch/ApplicationStatus>

**Patent Id:** 202131051640

**Published Date:** 10 Dec. 2021

**Abstract:** The invention discloses a system for monitoring underground mines using a Fiber Bragg Grating (FBG) chemical sensor, said system comprising: a FBG chemical sensor; a processor; a computer readable medium; a display; a user interface; an IOT device; a communication network; and a memory communicatively coupled to the processor. The method of monitoring hazardous toxic chemicals in underground mines comprising: fabricating said Fiber Bragg Grating (FBG) with a suitable Bragg wavelength; depositing a thin metal film of at least one of gold layer or silver layer; coating said FBG over said thin metal film with a reduced Graphene Oxide (rGO); monitoring Surface Plasmon Resonance; identifying said data by setting up a high-resolution tunable fiber ring laser interrogator; and sending said data to the user for real time monitoring of the leakage of hazardous toxic chemical.

## BOOK PUBLICATIONS

1. S. K. Raghuwanshi, **Santosh Kumar**, **Fiber Optic Communication-Optical Waveguides, Devices and Applications**, first edition, Universities Press, Hyderabad, India, Yr. 2017. ISBN: 9789386235213  
<https://universitiespress.com/details?id=9789386235213>
2. Ragini Singh and **Santosh Kumar**\*, “Applications of Graphene in Biomedical Industries,” Comprehensive Analytical Chemistry: Analytical applications of graphene for the comprehensive analytical chemistry Volume 99, Elsevier, 9 October 2020 (Book Chapter). DOI: <https://doi.org/10.1016/bs.coac.2020.08.008>  
**Hardcover ISBN:** 9780323853712; **eBook ISBN:** 9780323853729
3. S. K. Raghuwanshi, **Santosh Kumar**, Y. Singh “2D Materials for Surface Plasmon Resonance-based Sensors,” CRC Press, Taylor & Francis Group (Book) ISBN: 9781032041421, December 13, 2021.  
<https://www.routledge.com/2D-Materials-for-Surface-Plasmon-Resonance-based-Sensors/Raghuwanshi-Kumar-Singh/p/book/9781032041421#>
4. **Santosh Kumar**, N.K. Agrawal, Chinmoy Saha, and Rajan Jha “Optical Fiber-based Plasmonic Biosensors: Trends, Techniques, and Applications,” CRC Press, Taylor & Francis Group, Boca Raton, USA (Book) ISBN: 9781032152370, eISBN: 9781003243199, December 30, 2022. DOI: <https://doi.org/10.1201/9781003243199>  
<https://www.routledge.com/Optical-Fiber-based-Plasmonic-Biosensors-Trends-Techniques-and-Applications/Kumar-Agrawal-Saha-Jha/p/book/9781032152370>
5. Ragini Singh, **Santosh Kumar**, “Nanotechnology Advancement in Agro-Food Industry,” Publisher: Springer Singapore, ISBN: 978-981-99-5044-7, 25 Aug. 2023 (Book) Link: <https://doi.org/10.1007/978-981-99-5045-4>
6. S. K. Raghuwanshi, Mandeep Singh, Ritesh Kumar, **Santosh Kumar**, “Introduction to Microwave Photonics,” SPIE, USA, 2023 (Monograph) (In Press).
7. S. K. Raghuwanshi, **Santosh Kumar**, Ritesh Kumar “Recent trends on geometric feature-based fiber optic surface plasmon resonance sensors,” Springer Nature, 2023 (Book) (In Press).
8. **Santosh Kumar**, Abhilasha Mishra, Rajendraprasad A. Pagare, Carlos Marques, "Future Optical Access Systems (FOAS) Networks," Springer Nature, 2023 (Book) (In Press).
9. Baljinder Kaur, **Santosh Kumar**, Brajesh Kumar Kaushik, "Biomedical Sensors: Advanced Materials, Approaches and Enhancement Strategies," IEEE-Wiley, 2023 (Book) (In Press).
10. A. Kumari, S. Rajput, A. Jain, **Santosh Kumar**, “AI-based digital technologies in smart universities,” Advancements in Artificial Intelligence," Blockchain Technology, and IoT in Higher Education: Mitigating the Impact of COVID-19, pp. 83–104, 2023 (Book Chapter).

## **STUDENTS SUPERVISED**

### **M.TECH STUDENTS**

#	Name of Student	Thesis Title	University/ Institute	Degree Awarded/ Thesis Submission Date

1	Mr. Guiwei Zhang	Glycated haemoglobin detection	Liaocheng University, China	Ongoing
2	Mr. Xianzheng Lang	Xanthine detection	Liaocheng University, China	Ongoing
3	Mr. Lucan Xiao	Bacterial sensing	Liaocheng University, China	Ongoing
4	Mr. Fei Liu	Toxin sensing	Liaocheng University, China	Ongoing
5	Mr. Chaofan Gu	Bacterial sensing	Liaocheng University, China	Ongoing
6	Mr. Liu Xuecheng	Core-mismatch fiber based biosensors	Liaocheng University, China	Ongoing
7	Ms. Wen Zhang	Multi-tapered based fiber biosensors	Liaocheng University, China	Ongoing
8	Mr. Zhi Wang	Novel Taper-in-taper fiber structure-based LSPR sensor for alanine aminotransferase detection	Liaocheng University, China	Awarded (2023)
9	Mr. Li Muyang	2D Materials assisted core-mismatch based LSPR Sensor for Creatinine Detection	Liaocheng University, China	Awarded (2023)
10	Ms. Yu Wang	Development of highly sensitive optical fiber biosensor for p-Cresol and Cardiac Troponin I detection	Liaocheng University, China	Awarded (2022)
11	Mr. Guo Zhu	Tapered optical fiber-based LSPR biosensors for ascorbic acid detection	Liaocheng University, China	Awarded (2021)
12	Mr. Qing Shan Yang	Design and Performance of LSPR-based Optical Fiber Biosensor	Liaocheng University, China	Awarded (2020)

## AWARDS AND RECOGNITION

- Work as Optica Traveling Lecturer since Yr. 2018
- Became an Senior member of SPIE in August 2018.
- Became an IEEE Senior member in August 2019.
- Became an OSA Senior member in July 2020.
- **Working as Chair of Optica Optical Biosensors Technical Group Since Yr. 2022.**
- Appointed as an Associate Editor of IEEE Sensors Journal [IF: 4.325] in Nov. 2020.
- Appointed as an Associate Editor of IEEE Access Journal [IF: 3.476] in June 2021.
- Appointed as a Associate Editor of IEEE Transactions on NanoBioscience [IF: 3.206] in June 2021.
- Appointed as an Associate Editor of Biomedical Optics Express [IF: 3.562] in August 2021.
- Appointed as an Associate Editor of Frontiers in Physics [IF: 3.56] in March 2022.
- Appointed as an Associate Editor of IEEE Internet of Things [IF: 10.6] in April 2023.
- **Received 2022 Best Performing Associate Editor Award from IEEE Sensors Journal.**
- Became SPIE Fellow member in January 2023.

- Received the title of Shandong Provincial Distinguished Foreign Expert from Department of Science & Technology of Shandong Province (Shandong Administration of Foreign Experts Affairs).

## PROFESSIONAL SERVICES

### A. MEMBERSHIP IN TECHNICAL SOCIETIES

- Life Fellow Member- Optical Society of India, Membership no. L-740 (Since, Dec. 2015).
- Senior Member of the Institute of Electrical and Electronics Engineers (IEEE) [Membership no. 92166281] (10-Apr-2012 to 31-Dec-2022).
- SPIE FELLOW/Senior Member of Society of Photo-Optical Instrumentation Engineers (SPIE) [Membership no. 3447801] (6-Nov-2012 to 6-Nov-2022).
- Senior Member of OPTICA (OSA) [Membership no. 1037670] (31-March-2013 to 31-March-2025).
- Senior Member of the IEEE Photonics Society [Membership no. 92166281] (10-Apr-2016 to 31-Dec-2022).
- Member of the Institute of Electronics, Information and Communication Engineers (IEICE) [Membership no. 2380171] (Since, June 2023)

- B. **REVIEWER** (<https://www.webofscience.com/wos/author/record/609748>) – (Reviewed > **1750** SCI Journal Papers)

**Reviewer of Grants:** OSA- Siegman International School on Lasers (USA) 2018 - present  
**DST – SERB Funded Project**

- **PhD Thesis Evaluation – MNIT Jaipur, India in May 2021.**
- **PhD Thesis Evaluation – Benett University, India in June 2022.**
- **PhD Thesis Evaluation - Federal University of Espirito Santo (Vitoria-ES, Brazil) in Jan 2022.**

### C. EDITORIAL POSITION

- Working as an Associate Editor of IEEE Sensors Journal [IF: 4.325] since, Nov. 2020.
- Working as an Associate Editor of IEEE Access Journal [IF: 3.476] since, June 2021.
- Working as an Associate Editor of IEEE Transactions on NanoBioscience [IF: 3.206] since, June 2021.
- Working as an Associate Editor of Biomedical Optics Express [IF: 3.562] since, August 2021.
- Working as an Associate Editor of Frontiers in Physics [IF: 3.56] since, March 2022.
- Working as an Associate Editor of IEEE Internet of Things [IF: 10.6] since, April 2023.
- Lead Guest Editor - Special Issue on Frontiers in Physics and Frontiers in Sensors : Optical Fiber-based Plasmonics Biosensors for Biomedical Applications (2021): <https://www.frontiersin.org/research-topics/18809/optical-fiber-based-plasmonics-biosensors-for-biomedical-applications>
- Guest Editor - Applications of Photonic Sensors in Smart Cities (2022) – Frontiers in Physics: <https://www.frontiersin.org/research-topics/34703/applications-of-photonic-sensors-in-smart-cities>

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- Guest Editor - Special Issue "Nanomaterials: Theranostic Approach to Combat Oxidative Stress-Mediated Diseases" (April – Oct. 2022) – Materials Journal (MDPI)  
[https://www.mdpi.com/journal/materials/special\\_issues/nanomaterials\\_theranostic\\_combat\\_diseases](https://www.mdpi.com/journal/materials/special_issues/nanomaterials_theranostic_combat_diseases)
- Guest Editor – Special Issue "Materials and Devices with Magneto-Optical Properties for Communication and Sensing" (April – Oct. 2022) – Magnetochemistry Journal (MDPI)  
[https://www.mdpi.com/journal/magnetochemistry/special\\_issues/Materials\\_Devices\\_Magneto\\_Optical\\_Properties\\_Communication\\_Sensing](https://www.mdpi.com/journal/magnetochemistry/special_issues/Materials_Devices_Magneto_Optical_Properties_Communication_Sensing)
- Guest Editor – Special Issue "Optical Machine Learning for Communication and Networking" (May – Nov. 2022) – Photonics Journal (MDPI)  
[https://www.mdpi.com/journal/photonics/special\\_issues/OMLCN](https://www.mdpi.com/journal/photonics/special_issues/OMLCN)
- Guest Editor - Special Issue “Zero Dimensional Nanomaterials for Optoelectronic and Nanophotonic Devices” (2022) – Frontiers in Materials Journal (Impact Factor: 3.515):  
<https://www.frontiersin.org/research-topics/41335/zero-dimensional-nanomaterials-for-optoelectronic-and-nanophotonic-devices>
- Guest Editor- Special issue on: "Advanced Photonic Devices and Sensing Systems" to be published in Frontiers in Physics Journal (2022) – Frontiers in Physics. Link: <https://www.frontiersin.org/research-topics/43218/advanced-photonic-devices-and-sensing-systems>
- Guest Editor – Special Issue "Optical Signal Processing" (Oct. 2022 – Aug. 2023) – Photonics Journal (MDPI). [https://www.mdpi.com/journal/photonics/special\\_issues/9614R66PD1](https://www.mdpi.com/journal/photonics/special_issues/9614R66PD1)
- Guest Editor – Special Issue "Silicon Photonics for Label-Free Biosensors" (April – Sept. 2023) – Frontiers in Sensors Journal. Link: <https://www.frontiersin.org/research-topics/55142/silicon-photonics-for-label-free-biosensors>
- Guest Editor – Special Issue "Non-Linear Photonic Sensors" (April – Sept. 2023) – Frontiers in Physics Journal. Link: <https://www.frontiersin.org/research-topics/54302/non-linear-photonic-sensors>
- Guest Editor – Special Issue "Novel Smart Materials for Optical Fiber Sensor Development" (June 2023 – Feb. 2024) – Materials (MDPI) Journal. Link: [https://www.mdpi.com/journal/materials/special\\_issues/BOX13672NZ](https://www.mdpi.com/journal/materials/special_issues/BOX13672NZ)
- Guest Editor – Special Issue "Advances in Optical Biosensors for Biomedical Applications" (Oct. 2023 – Jan. 2024) – Biomedical Optics Express (Optica) Journal. Link: [https://opg.optica.org/boe/journal/boe/feature\\_announce/aobba.cfm](https://opg.optica.org/boe/journal/boe/feature_announce/aobba.cfm)

D. **[LIST OF RECENT WEBINARS ORGANIZED UNDER THE OPTICAL BIOSENSORS \(BB\) - OPTICA TECHNICAL GROUP:](#)**

Sr. No.	Speaker	Topic	Date
1	Prof. Anselmo Frizera-Neto, Universidade Federal do Espirito Santo	Optical Fiber Sensors for the Next Generation of Rehabilitation Robotics	15 March 2022
2	Prof. Daniele Tosi, Nazarbayev University, Kazakhstan	Optical Fiber Biosensors for Mini-Invasive Medical Devices	6 May 2022
3	Prof. Cosimo Trono, Istituto di Fisica Applicata "Nello Carrara"	Optical Fiber Biosensors: From the Design to the Practical Realization	23 May 2022
4	Prof. Mohd Adzir Mahdi, Universiti Putra Malaysia	Lab-on-Fiber Biophotonic Sensors	8 June 2022
5	Prof. Paola Saccomandi, Politecnico di Milano	The New Thermometry with Light: Fiber Optic Sensors and Hyperspectral Imaging for Monitoring Thermal-Based Therapies for Localized Tumors	13 April 2023
6	Prof. Andrea Cusano, University of Sannio, Italy	Lab on Fiber Technology: Towards New Advanced Optical Optodes for Life Science Applications	6 July 2023
7	Prof. Christophe Caucheteur, University of Mons, Belgium	Tilted Fiber Bragg Gratings: From Multiparametric Sensors to Plasmonic Biosensors	7 Sept. 2023

#### TEACHING/RESEARCH PLAN FOR NEXT FIVE YEARS

Recently, we have developed the various optical fiber-based biosensors to detect and measure the various biomolecules such as cholesterol, glucose, dopamine, ascorbic acid, L-Cysteine, Collagen etc. We have used and fabricated the sensors using various special fibers such as tapered optical fiber, fiber ball structure, single mode-multimode mismatch fiber, hollow-core fiber, photosensitive fiber, seven core multicore fiber etc. Tapered fiber structure was fabricated using a hydrogen-oxygen flame technique and plasma technique. Remaining fiber sensor structures were fabricated using an advanced fusion splicer machine. Further to increase the sensitivity of sensors, various nanoparticles such as gold nanoparticles, silver nanoparticles, graphene oxide, copper oxide nanoparticles, copper oxide nanoflower, zinc oxide nanoparticles, molybdenum disulfide, etc were used. Thereafter, several specific enzymes were used to incorporate the selectivity property of the biosensors. I have learned the various equipment such as high-resolution transmission electron microscope (HR-TEM), scanning electron microscope (SEM), energy dispersive spectroscopy (EDS), UV-Vis Spectrophotometer, atomic force microscopy (AFM), etc for the characterization of sensor structure. The developed sensor works on the phenomena of localized surface plasmon resonance (LSPR) due to coating of nanoparticles over fiber structure.

Recently developed the multicore optical fiber-based biosensors for detection of cancer cells. We have cultured the six different normal and cancer cells and detected using developed sensor [Published in Biosensors & Bioelectronics, 2020/2021 (IF: 12.545)]. In current project work, optical fiber biosensors are developing for detection for Shigella Bacteria that is responsible for the Bacillary Dysentery in developing countries. Overall, I have wide exposure of fabrication and development of optical fiber-based biosensors for clinical applications and to use it in day-to-day life in society. I would like to set-up optical fiber sensor fabrication and cell culture lab for development of biosensors for detection of cancer cells and other microorganisms.

My aim has been performing an effective teaching and quality research work in the field of Electronics and Communication Engineering.

#### DECLARATION

I hereby declare that the above are true to the best of my knowledge.

**Date: 20/09/2023**

**Place:** Liao Cheng, China.

**Dr. Santosh Kumar**