

Vemuri S R S Praveen Kumar

Senior Project Fellow cum Doctoral Researcher
Optical Thin Films Laboratory
Optical Devices and Systems Division
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Research Interests

Optical thin film filters, Graded Coatings, Antireflection and High reflection coatings, nanostructure thin film preparation and characterization, sensors and applications

Work Area Design and Fabrication of Optical Filters, Maintenance of Coatings Plants, Characterization of filters

Education

- 2011 – 2013 Master of Technology in Nano electronics at SASTRA University, Thanjavur, India, with 73.65%
- 2007 – 2011 Bachelors of Technology in Electrical and Electronics Engineering at SASTRA University (SRC), Kumbakonam, India with 68.97%
- 2005 – 2007 Senior School Education at Tejaswi Junior college, Ongole, India with 85.30%
- 2004 – 2005 Secondary School Education at Ravindra Barathi public School, Ongole, India with 82.0%

Academic Thesis

Master's Thesis titled on "Preparation of ZnO Nano Structures by Solution Combustion Synthesis and Studies on the Optical and Structural Properties"

Bachelor's Thesis titled on "Touch Screen Controlled Wireless Human Being Detection Robot with Video Camera"

Under Graduate In-plant Training

Ennore Thermal Power Station, North Chennai, Tamilnadu India
Clarion Power Corporation limited, Ongole, India.

Achievements and Awards

- Best Poster award at 2nd CRIKC Nano science Day, on 8th August, 2016, at Indian Institute of Science Education and Research (IISER), Mohali.
- SASTRA University Third Rank Holder in Master's Degree
- Gold medal in Karate (katas) in district level

Software Skills

Statistical Tools: Origin 16 Pro, Microsoft Visio
MEMS Analysis Software: CoventorWare
Thin film design software: FILMSTAR™, Macleod, Basics of Optilayer.

Hands on Experience

Thin film coating equipment's like Electron beam deposition plant, Thermal coating plant and ion assisted coating plant.
Characterisation equipment's like UV-VIS-NIR spectrophotometer, Gonio spectrophotometer, Ellipsometer and Reflectometer

Workshops attended

Name	The Institute of Optics, “ Summer Short Course Series on Optical Thin films ”
Year	June 20 to 24, 2016
Place	The University of Rochester Robert B. Goergen Hall of Biomedical Engineering River side campus, Rochester, New York, USA
Grant Provided	International Travel Support Scheme, Science and Engineering Research Board (SERB), Department of Science and Technology (DST), Government of India.

Membership Details

Year	Mar 2015 – Present
Professional Society	Optical Society of America, USA
Membership Id	1184066 (Student Member)
Year	Oct 2015 – Present
Professional Society	Society of Photo-Optical Instrumentation Engineers, USA
Membership Id	3654174 (Student Member)
Year	Dec 2016 - Present
Professional Society	Optical Society of India, India
Membership Id	L-793 (Life Member)

Research Experience

Position	Senior Project Fellow cum Doctoral Researcher CSIR-CSIO, Chandigarh
Project	Graded Optical Thin film Technologies
Year	Aug 2013 – Present

Project Synopsis: This project aims to develop an optical thin film filter technologies for enhanced vision systems to be used in strategic, medical and industrial domain in the following areas: Optimization of transmissivity and reflectance of optical systems, Realization of Rugate filter, Use of glass-alternate substrates, Optimization of anti-reflective, reflective, transmissive, Notch and Neutral density filters.

Nature of Duties:

- Design of optical thin film filters using simulation software's like Filmstar, Optilayer and Macleod.
- Design and optimization of optical filters using various design and computational optimization techniques.
- Study, analysis and optimization of process parameters for fabrication of optical filters.
- Reviewed various methods for producing optical thin films, thin film structure and formation, vacuum environment, components of a deposition system, optical and physical thickness monitoring techniques, uniformity and process control.
- Strategy generation and recipe creation for the coating process.
- Hand on experience in operating Electron beam evaporation coating plant (Pfeiffer PLS 570), Thermal deposition plant (HHV TF 500) and Dual e-gun ion-assisted coating plant (Evatec BAK 761) for fabrication of optical thin film filters.
- Hands on experience on optical characterization of thin films using spectroscopic techniques (UV-VIS-NIR spectrophotometer, Gonio Spectrophotometer, Reflectometer, Ellipsometer, X-ray Diffractometer (XRD), Fourier Transform Infrared Spectroscopy (FTIR) for determination of refractive index, surface roughness, film analysis and quality testing.
- Cleaning, repair and maintenance of the coating plant.

Position Graduate Intern,
ISRO - Semi Conductor laboratory, Mohali

Project Development and Fabrication of Capacitive Micro machined Ultrasonic Transducer for Ultrasound Imaging Technology

Year Jan – July 2013

Synopsis Project: The aim of the project is to analyse the design and measure various parameters of Capacitive Micro-machined Ultrasonic Transducer using CoventorWare software. Various factors affecting the design and working are studied. The design is made as per the specifications and consideration of various technological aspects and constraints in Semiconductor Laboratory, ISRO, Chandigarh. Modelling is done with realistic assumption, standard conditions and data as far as possible. A solid model is generated as per the process guidelines and run card used. Mechanical, electrostatic and coupled electromechanical analysis are also performed. The various parameters greatly affecting the performance of CMUT such as resonant frequency and collapse voltage are analysed. Further, various modes of vibration of the membrane are characterised. Deformation of membrane against various parameters and its effect on capacitance, electrostatic force etc., are analysed as well.

Research Publications

S.No.	Title	Name	Year	Authors
1.	Design of Single Cavity Band Pass Graded Index Optical Filter with Quintic Apodization	Elsevier, Materials Today Proceedings	Under Review	Vemuri SRS Praveen kumar, P. Sunita, Mukesh kumar, Neelam Kumari, Vinod karar, Amit L.Sharma
2.	Optimization of optical parameters for the design of multilayer bandpass filter using genetic algorithm	Elsevier, Materials Today Proceedings	Under Review	Sunita Parinam, Vemuri SRS Praveen kumar, Mukesh kumar, Neelam Kumari, Vinod karar, Amit L.Sharma
3.	Design of Multiple Stop Band Optical Filter using Refractive Index Modulation	Journal Of optics, Springer	Under Review	Vemuri SRS Praveen kumar, P. Sunita, Mukesh kumar, Neelam Kumari, Vinod karar, Amit L.Sharma
4.	Effect of Peak-to-Peak Refractive Index Variation on the performance of Graded Filters: A Comparative Study	OSA Technical Digest	2016	Vemuri SRS Praveen kumar, P. Sunita, Mukesh kumar, Neelam Kumari, Vinod karar, Amit L.Sharma
5.	Design of Optical Multilayer Band Pass Filter Using Genetic Algorithm	ISST Journal of Applied Physics	Vol.7 (2016) No.1 / 2 [ISSN: 0976-903X]	Sunita Parinam, Vemuri SRS Praveen Kumar, Neelam Kumari, Mukesh Kumar, S.K. Mittal, Vinod Karar and Amit L. Sharma
6.	Design and Fabrication of Multilayer Dichroic Beam Splitter	Advanced Material Proceedings	Accepted	Vemuri SRS Praveen kumar, P. Sunita, Mukesh kumar, Neelam Kumari, Vinod karar, Amit L.Sharma
7.	Design and Optimization of High Reflectance Graded Index Optical filter with Quintic Apodization	SPIE	2015	Vemuri SRS Praveen kumar, P. Sunita, Mukesh kumar, P .Krishna Rao, Neelam Kumari, Vinod karar, Amit L.Sharma

8.	Estimation of Optical Constants and Thicknesses of E-beam Deposited TiO ₂ Thin Films by Envelope Method	Elsevier	2014	Vemuri SRS Praveen kumar, P. Sunita, Mohit Saraf, Mukesh kumar, P .Krishna Rao, Neelam Kumari, Vinod karar, Amit L.Sharma
9.	Alternately stacked TiO ₂ /Al ₂ O ₃ multilayer based optical filter fabricated by Electron beam evaporation technique	Elsevier	2014	Mohit Saraf , Mukesh kumar, P. Sunita, Vemuri SRS Praveen kumar, P. Krishna Rao, Neelam Kumari, Vinod karar, Amit L.Sharma
10.	Synthesis of ZnO Nanoparticles using Carboxymethyl cellulose Hydrogel	Asian journal of applied sciences	2014	V.Manoj, M.karthika, V.S.R.praveen kumar, S.Boomadevi, K.Jeyadheepan, R.K.Karn, R.John Bosco Balaguru, S.K.Pandiyam

Book Chapter:

Sunita Parinam, S. R. S. Praveen Kumar Vemuri, Mukesh Kumar, Neelam Kumari, Krishna Rao Parinam, Vinod Karar, and Amit L. Sharma “**Optical Thin Film Filters: Design, Fabrication and Characterization.**” High Performance Materials and Engineered chemistry, Apple Academic Press, CRC Publishers, 2017. <http://www.appleacademicpress.com/high-performance-materials-and-engineered-chemistry-/9781771885980>

Conference Poster Presentations

Optimization of optical parameters for the design of multilayer bandpass filter using genetic algorithm

Sunita Parinam, VSRS Praveen Kumar, Mukesh Kumar, Neelam Kumari , SK Mittal, Vinod Karar, Amit L Sharma

International Conference on Material Processing and Characterization organized by Department of Mechanical Engineering, Gokaraju Rangaraju Institute of Engineering and Technology, Hyderabad, March, 2017.

Design of Single Cavity Band Pass Graded Index Optical Filter with Quintic Apodization

VSRS Praveen Kumar, Sunita Parinam, Mukesh Kumar, Neelam Kumari , Vinod Karar, Amit L Sharma
International Conference on Material Processing and Characterization organized by Department of Mechanical Engineering, Gokaraju Rangaraju Institute of Engineering and Technology, Hyderabad, March, 2017.

Effect of Peak-to-Peak Refractive Index Variation on the Performance of Graded Filters: A Comparative Study

Vemuri SRS Praveen Kumar, Parinam Sunita, Mukesh Kumar, Neelam Kumari, Vinod Karar, and Amit L Sharma

International Conference on Fiber Optics and Photonics- Photonics 2016 organized by Indian Institute of Technology Kanpur, Kanpur, Uttar Pradesh, India, December, 2016.

Design of Multiple Stop Band Optical Filter using Refractive Index Modulation

Vemuri SRS Praveen Kumar, Parinam Sunita, Mukesh Kumar, Neelam Kumari, Vinod Karar, and Amit L Sharma

International Conference on Light and Light based Technologies (ICLLT-16) organized by Tezpur (Central University), Tezpur, Assam, India, November, 2016.

Performance Comparison of dielectric multilayer stack for beam splitting applications.

Nancy Sharma , P Sunita , VSRS Praveen Kumar, Mukesh Kumar, P Krishna Rao, Neelam Kumari, Vinod Karar, Amit L Sharma

“Second annual meeting of CRIKC Nanoscience group on 2nd CRIKC Nanoscience Day” organised by Institute of Nanoscience and Technology (INST), Mohali, Punjab, India, August, 2016.

Design and fabrication of Titania–Hafnia multilayer filter for optical display Applications

Vemuri SRS Praveen Kumar, P Sunita, Nancy Sharma, Mukesh Kumar, P Krishna Rao, Neelam Kumari,

Vinod Karar, Amit L Sharma

“Second annual meeting of CRIKC Nanoscience group on 2 nd CRIKC Nanoscience Day” organised by Institute of Nanoscience and Technology (INST), Mohali, Punjab, India, August, 2016.

Award: Best Poster

Design of Optical Multilayer Band Pass Filter Using Genetic Algorithm

Sunita Parinam, Vemuri SRS Praveen Kumar, Neelam Kumari, Mukesh Kumar, S.K. Mittal, Vinod Karar and Amit L. Sharma

4th National Conference on Nanoscience and Instrumentation Technology (NCNIT) held at National Institute of Technology, Kurukshetra, Haryana, India, 2016.

Award: Best Poster

Design and Fabrication of Multilayer Dichroic Beam Splitter

Vemuri SRS Praveen kumar, Mukesh kumar, P.Sunita, Neelam Kumari, Vinod karar and Amit L.Sharma

International Conference on Materials Science & Technology (ICMTech) held at University of Delhi, 2016.

Design and Fabrication of Alumina/Silica Optical Bandpass Filter

Gaurav Dwivedi, Nancy Sharma, VSRS Praveen Kumar, P. Sunita, Mukesh Kumar, Neelam Kumari, Vinod Karar, and Amit L. Sharma

National conference on Fascination of Light and Photonics for Life, held at Post Graduate Govt. College for Girls, Chandigarh, 2016.

Reproducibility Analysis of E-beam Deposited Multilayer Dielectric Reflective Filter

Nancy Sharma, P. Sunita, VSRS Praveen Kumar, Gaurav Dwivedi, Mukesh Kumar, Neelam Kumari, Vinod Karar, and Amit L. Sharma

National conference on Fascination of Light and Photonics for Life, held at Post Graduate Govt. College for Girls, Chandigarh, 2016.

Study on the effect of peak-to-peak Refractive index variation on the performance of Rugate filters using Quintic function

Vemuri SRS Praveen kumar, Mukesh kumar, P. Sunita, P. Krishna Rao, Neelam Kumari, Vinod karar and Amit L.Sharma

International conference on Opto -Electronics and Photonic Materials (ICOPMA) held at SASTRA University, 2015.

Study of optical and surface characteristics of e-beam deposited TiO₂ thin films

P. Sunita, Vemuri SRS Praveen kumar, Mukesh kumar, P. Krishna Rao, Neelam Kumari, Vinod karar and Amit L.Sharma

First International Conference on Advanced Materials for Power Engineering (ICAMPE 2015), held at Mahatma Gandhi University, Kottayam, Kerala, 2015.

Award: Best Poster

Design of Alternately Stacked ZnS/MgF₂ and CdS/MgF₂ ultra-thin multilayer Optical Filters

Vemuri SRS Praveen kumar, Mukesh kumar, P. Sunita, P. Krishna Rao, Neelam Kumari, Vinod karar and Amit L.Sharma

First International Conference on Advanced Materials for Power Engineering (ICAMPE 2015), held at Mahatma Gandhi University, Kottayam, Kerala, 2015.

Design and Optimization of High Reflectance Graded Index Optical filter with Quintic Apodization

Vemuri SRS Praveen kumar, P. Sunita, Mukesh kumar, P. Krishna Rao, Neelam Kumari, Vinod karar and Amit L.Sharma

International Conference on Optics and photonics (ICOP) held at University of Calcutta, 2015.

Estimation of Optical constants and Thickness of E-beam deposited metal oxides films by Envelope Method

P. Sunita, Vemuri SRS Praveen kumar, Mukesh kumar, P. Krishna Rao, Neelam Kumari, Vinod karar and

Amit L.Sharma

International Conference on Optics and photonics (ICOP) held at University of Calcutta, 2015.

Alternately stacked TiO₂/Al₂O₃ multilayer based optical filter fabricated by Electron beam evaporation technique

Mohit Saraf , Mukesh kumar, P. Sunita, Vemuri srs Praveen kumar, P. Krishna Rao, Neelam Kumari, Vinod karar and Amit L.Sharma

International conference on Exploring Basics and Applied sciences for next generation Frontiers held at Lovely Professional University (LPU), 2014.

Award: Best Poster

Estimation of Optical Constants and Thicknesses of E-beam Deposited TiO₂ Thin Films by Envelope Method

Vemuri SRS Praveen kumar, P. Sunita, Mohit Saraf, Mukesh kumar, P .Krishna Rao, Neelam Kumari, Vinod karar and Amit L.Sharma

International conference on Exploring Basics and Applied sciences for next generation Frontiers held at Lovely Professional University (LPU), 2014.

Conferences Attended

- Two day Symposium on Modern Information and Communication Technologies for Digital India (MICTDI-2016) organized by Institute of Electronics and Telecommunication Engineers (IETE), New Delhi and CSIR-Central Scientific Instruments Organisation, Chandigarh during 9th -10th April, 2016.
- National conference on Fascination of Light and Photonics for Life, held at Post Graduate Govt. College for Girls, Chandigarh, 22nd Jan 2016.
- International conference on thin films and Applications held at SASTRA University, India, 2012.
- International Conference on Functional Nano materials held at SASTRA University, India, 2011.

Personal Details

Full Name	Vemuri SRS Praveen Kumar
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Sex	Male
Religion	Hindu
Category	General
Nationality	Indian
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References

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