Raghunath K. Shevgaonkar, *Ph. D., Fellow IEEE*

Department of Electrical Engineering, I.I.T. Bombay, Powai, Mumbai 400076, INDIA
Ex-Director, I.I.T. Delhi, Hauz Khas, New Delhi 110016, INDIA
Ex-Vice Chancellor, University of Pune, Pune, 411016, INDIA
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PROFESSIONAL PROFILE

- Fellow of IEEE and accomplished educational leader, able academic administrator and institution builder. Director (same as President) of a top ranked technology institute in India (IIT) and Vice Chancellor of one of the largest comprehensive universities.
- Innovative and inspiring teacher in electrical engineering through conventional as well as electronic mode. Two times IEEE awardee for teaching and educational leadership, and writer of a textbook with McGraw Hill Education, India.
- Multi-faceted personality with research in diverse areas in electrical engineering and physics, and comprehensive knowledge of Indian classical music.

EDUCATION

Doctor of Philosophy (Ph.D.) Indian Institute of Technology Bombay and Indian Institute of Astrophysics / Raman Research Institute, Bangalore, 1985

- Major: Electrical Engineering
- Support Area: Radio astronomy and Image Processing
- Thesis title: “Maximum Entropy Restoration of Astronomical Images”
- Thesis Supervisors: Prof. S. Mahapatra and Prof. Ch. V. Sastry

Master of Technology (M. Tech.) Indian Institute of Technology Kanpur, 1977

- Major: Electrical Engineering
- Specialization: specialization in Electromagnetics and Optical fibers
- Dissertation title: “Propagation of light in an anisotropic optical fiber”
- Dissertation Supervisor: Prof. Dilip K Paul
- Highest GPA of 9.6/10 in the batch

Bachelor of Engineering (B. E.) Jiwaji University, Gwalior, 1975.

- Major: Electronics Engineering
- Distinction: Gold Medal for securing top rank in the batch

Bachelor of Music (B. Mus. Diploma) Indira Kala Kheragadh Music University, 1975

- Major: Hindustani Classical music
- Specialization: Instrumental (Sitar)

Executive Development Program, Kellogg School of Management, Northwestern University, Chicago, USA, 2007.

MAJOR SCIENTIFIC and PROFESSIONAL ACHIEVEMENTS

- Started a Centre on Cyber Systems and Information Assurance at IIT Delhi.
- Established a Technology Department at University of Pune with an industry oriented research focus.
- Contribution made in wide areas like Radio Astronomy and Antennas, Fiber Optic Communication, Image processing, and Distance Engineering Education.
- A textbook on 'Electromagnetic waves' and a monograph on 'Transmission lines' published by McGraw Hill Education India.
- Creation of e-content in Electromagnetics and transmission lines, and Optical communication.
- Design and development of a large Decameter Wave Radio Telescope at Gauribidnur, India. It is one of the unique and largest low frequency radio telescopes in the world.
- Established a Centre for Distance Engineering Education Program (C-DEEP) at IIT Bombay.
- Development of image processing and data analysis software for low frequency radio astronomy.
- Study of the Sun from microwave observations using the largest radio telescope, the Very Large Array at New Mexico.
- Modeling and reconstruction of the 3-D structure of solar active regions and solar flares, and estimation of the solar parameters.
- Study of flare stars to establish non-thermal radiation during non-flaring periods.
- Development of Maximum Entropy Image restoration algorithm for polarized images of the Sun obtained with phase unstable aperture synthesis data.
- Establishing an advanced Fiber Optic laboratory at IIT Bombay
- Development of generalized framework for designing various types of optical fibers like the ultra-low dispersion fibers, dispersion compensating fibers, large effective area fibers etc.
- Innovative idea of optically controlled semiconductor antennas.
- Investigations of optically controlled microwave devices like phase shifter, attenuator, polarizer etc.
- Optically reconfigurable microwave filters and other devices.
- Innovative use of de-convolution algorithm for detection of straight lines in a digital image.
- Electrical modeling of photonic crystal devices for optical filter design.

EXECUTIVE WORK EXPERIENCE

Director, IIT Delhi, Sept 2011 – June 2015.

- IIT Delhi is a technical university of national importance established by an Act of Parliament
- Director in Indian Institutions is same as the University President in the USA.
- Director is academic and administrative head of the institution.
- IIT Delhi is the highest ranked (According to QS, Indian Today, and Outlook ranking) university in India imparting UG and PG education and carrying out research of global standards in all disciplines of engineering and science.
- IIT Delhi is a fully residential institute spread over a campus of 350 acres, and has about 9000 students and 500 faculty members in engineering, science, management, and Social sciences.

Vice Chancellor, University of Pune, Mar 2010 – Sep 2011.

- University of Pune is one of the largest state funded comprehensive universities with about 1000 affiliated colleges and institutions with total student registration of more than 650 thousand.
- Vice Chancellor is the executive and academic head of the university.
- Established a new Technology department for promoting industrial research.
- Introduced online examination system and e-governance in university functioning.

Deputy Director (Finance and External Affairs) IIT Bombay, 2008 – 2010.

- Deputy Director is responsible for financial management of the institute, and external linkages with alumni and other international institutions.
- IIT Bombay is one of the largest IITs with about 8000 students and 500 faculty members in engineering, science and management.
- Automated purchase process through e-tendering and e-auction.

Dean, Resource Mobilization, IIT, Bombay 2005 – 2008.

- Primarily responsible for fund generation from alumni and other sources.
- More than 25 M$ funds were raised during the tenure.

Registrar, IIT, Bombay 2005 – 2006.

- General administration at IIT Bombay, such as, staff welfare, recruitment, institute upkeep etc.

Dean of Students' Affairs, IIT, Bombay, 1998 – 2000.

- IIT Bombay is fully residential institute with about 8000 students residing in the hostels.
- The Dean is overall in-charge of all student related activities except the academics.
- Dean is also responsible for students' welfare and sports and cultural activities.
- A new Technology Student Festival started during the tenure. The festival became iconic that provides a platform for displaying technology development by college students.
- He is in-charge of all the hostels and the hostel staff.

Head, Department of Electrical Engineering, IIT, Bombay, 2003 – 2005.

- One of the largest departments with more than 60 faculty.
- Department has five sub groups namely, communications, Controls and instrumentation, micro and nano electronics, power electronics and power systems, signal processing.
- The Head is responsible for faculty recruitment, research funding and UG and PG curricula and admissions.

Founder Head, Centre for Distance Engineering Education Programme (CDEEP), IIT, Bombay 2002 - 2006.

- Played a visionary role in setting up a Center to generate and disseminate the video and web lectures from experts in IIT to the students of engineering colleges in the country using multi-media technology. Developed policies for MOOCs and other similar activities.
- The Centre also executes the National Project on Technology Enhanced Learning (NPTEL), a major e-learning initiative of Govt. of India with a total financial outlay of 20 M$.
- Served as Chairman of the NPTEL mission project for more than a decade.

Chairman, Hostel Coordination Unit, Indian Institute of Technology, Bombay, 1995 – 1998.

- Responsible for operation of all the 13 hostels and messing facilities.
- Development of room allotment policy for UG and PG students.
- Recruitment and control of more than 300 hostel employees.

Hostel Warden, Indian Institute of Technology, Bombay 1992 - 1995.

Assoc. Warden, Hostel 4, Indian Institute of Technology, Bombay 19989 - 1992.

ACADEMIC EXPERIENCE

Institute Chair Professor, Department of Electrical Engineering IIT, Bombay. It is an honor that is bestowed on high achieving professors of a department of IIT Bombay.

Professor of Electrical Engineering IIT, Bombay, 1990 - Present. Joined IIT Bombay as Assistant Professor in 1987 and was directly promoted to Professor in 1990.

- Undergraduate Teaching: Electromagnetic Waves, Principles of Communication, Basic Electronics, Analog circuits, Satellite communication, Fiber optic communication, Image processing. (Typical class size of 60 -100)
- Postgraduate Teaching: Optical Communication, Computational electromagnetics, Image processing. (Class size of 40-60)
- Research in Photonics, Fiber optics, Image processing, Printed antennas, Optically controlled microwave devices.

Visiting Professor, Institute Superior de Electronics de Paris, France, June 2009.

Visiting Professor, High Frequency Institute, ETH, Zurich, Switzerland, June-Aug, 2005.

Adjunct Professor, CEEN, University of Nebraska, Omaha, NE, USA, 2002- today.

Visiting Professor, Computer and Electronics Engineering, University of Nebraska, Lincoln, USA (on Sabbatical leave) Aug 2000 – Dec 2001.

- Undergraduate Teaching: Electronic circuits, Digital signal processing, Satellite communication.
- Graduate Teaching: Optical communication, Image processing.
- Participated in preparation of ABET

Faculty Research Associate University of Maryland, College Park, U.S.A., Dec. 1982- Dec. 1984 and again Jan 1987 – Dec 1987.

- Research: Solar and Stellar radio astronomy with the VLA, the largest radio telescope in the world. Modeling of sunspots and solar active regions and solar flares.

Reader Indian Institute of Astrophysics, Bangalore Jan 1985 – Dec 1986.

- Research: Study of Galactic radio sources at decameter wavelength. Image processing of radio images to correct for atmospheric distortion.

Electronics Engineer Indian Institute of Astrophysics and Raman Research Institute, Bangalore. July 1978 – Dec 1982.

- Research and development: Design and Installation of a large Decameter array used for radio astronomy at Gauribidnur, India. The telescope is one of the largest in the world at decameter wavelength.

HONORS, AWARDS and DISTINCTIONS

- *Fellow IEEE*
- *Fellow Indian National Academy of Engineering*
- *Fellow National Academy of Science, India*
- *Fellow Institute of Electronics and Telecommunication Engineers*
- *Fellow Institution of Engineers*
- *Fellow Optical Society of India*
- *Fellow Maharashtra Academy of Science*, India

- *IEEE William Sayle Education Award 2014*: Only one award is given annually across the world for leadership in electrical engineering education.
- *IEEE UG Teaching Award 2011*: Only one award is given annually across the world for outstanding contribution to engineering undergraduate teaching. For the first time since its inception, the award was given to a Professor outside the USA.
- *Institution of Electronics and Telecommunication Engineers - CEOT-94 Award* for outstanding contribution in the field of Photonics and Opto-electronics.
- *'Excellence in Teaching Award'* of IIT, Bombay, 2004.
- *VASVIK Award* in Information and Communication technology, 2009: Only one award is given every year across the country.
- *Ram Lal Wadhawa Award of IETE* for achievements in Radio Astronomy, Fiber Optics and Electromagnetics, 2013. Only one award is given every year across the country.
- *'Excellence in Education Award'* by Top Management Consortium, Mumbai for leadership in higher education, 2010.
- *Dewang Mehta Business School Award* for Outstanding contribution to Education, 2010.
- *Mahaganapati Award* for Excellence in Academics and Research, 2010.
- *Programme Chair* for International Conference Photonics, 2002.
- *Advisor*, Sixth International Infrastructure Business Summit and Expo, TELECOM India, 2004.
- *Hon. Editor* IETE Special Issue on 'Next Generation Networks', 2008.
- *Editor*, IETE Journal of Education.
- *Member of Technical Programme Committees* for many International and National conferences.

PROFESSIONAL MEMBERSHIPS

- Member International Astronomical Union.
- Member Astronomical Society of India.
- Graduate Fellow University of Nebraska, Lincoln, USA

RESEARCH INTERESTS

- Fiber Optic Communication
- Photonics
- Non-linear fiber optics
- Electromagnetic Waves
- Computational Electromagnetics
- Antennas
- Image Processing
- Radio Astronomy

COURSES TAUGHT (in India and in US)

- Fiber Optic Communication (PG)
- Digital Signal Processing (UG/PG)
- Principles of Communication (UG)
- Satellite Communication (UG/PG)
- Analog Circuits (UG)
- Basic Electronics (UG)
- Electromagnetic Waves (UG)
- Computational Electromagnetics (PG)
- Image Processing (PG)
- Radio Astronomy (UG/PG)

RECENT INVITED TALKS

- TEQUIP talk at IIT Bombay 'Teaching Electromagnetic Waves in enjoyable fashion'.
- Visionary talk on 'ICT in Higher Education' in Engineering Congress 2014 at Hyderabad.
- Plenary Talk at IEEE conference ANTS-2014 at New Delhi.
- Graduation ceremony address at Indian Institute of Industrial Engineering 2013.
- J.C. Bose Memorial Lecture at Institution of Electronics and Telecommunication Engineering, New Delhi 2013.

- Council of Scientific and Industrial Research Foundation Day Lecture 2013 at National Physical Laboratory, New Delhi.
- Thematic lecture on 'Invisible Universe' at Indian National Academy of Engineering, New Delhi.
- On 'Higher Education Model for Developing Economies' at Glion (Switzerland) conference of Global University Presidents 2013.
- Convocation Address at Coimbatore Institute of Technology, Coimbatore 2013.
- Keynote Address at College of Engineering Trivendrum in a National Conference on Advancements in Electrical Engineering, 2013.
- Keynote Address at Institution of Engineers on the occasion of Engineers day 2013.
- Indo-US Higher Education Summit at Gorge Town University, Washington DC 2012.
- Convocation Address of College of Engineering Pune, 2010.
- Convocation Address for National Defense Academy, Pune 2010.

THESES and DISSERTATIONS SUPERVISED (List Attached)

- Ph. D. 18
- M. Tech. 41
- B. Tech. > 50
- M. Sc. 2

SHORT COURSES CONDUCTED FOR INDUSTRY PROFESSIONALS

- Fiber optic communication and Photonics (5 days) Four times
- Image processing (5 days)
- Antennas (3 days)
- Satellite communication (3 days)
- Telematics (5 days) Two times
- Computational Electromagnetics (5 days)
- Electromagnetic Waves (5days) Three times
- Many invited talks in short term courses on Antennas, Image processing, Fiber optic communication, Electromagnetics, etc.

SPONSORED PROJECTS PRINCIPAL INVESTIGATOR

- National Project for Technology Enhanced Learning (NPTEL-II and III), under the Ministry of Human Resources Development (MHRD), Govt. of India.
- National Project for Technology Enhanced Learning (NPTEL-I), under MHRD.
- Fiber optic communication by Ministry of Human Research Development, India.
- MIC Tapered slot antenna under Defence Science and Technology Research,

India.

- Fiber optic communication and photonic switching Ministry of Human Research
- Development, India.
- VLSI designing of picture processing unit for DTV under Department of Electronics, India
- Wavelength Division Multiplexed fiber optic links under All India Council of
- Technical Education, India.
- Optically controlled Semiconductor Antenna under Department of Electronics, Govt. of India

CONSULTANCY PROJECTS

- Automatic Signature Verification by Tata Infotech.
- Hindi Script reading System by Tata Infotech.

OTHER PROFESSIONAL ACTIVITES

- Setting up Fiber Optics Laboratory at IIT, Mumbai.
- Development of a 20 min. video program on fibre optics for UGC,
- Continuing Education Program.
- Development of educational software to effectively demonstrate the concepts of
- Electromagnetic Waves
- Development of graphical package to bring out concepts of fibre optic communication more effectively.
- Development of CAD for Microwave Amplifier Design.
- Development of Beam Propagation software for non-linear pulse propagation in a fiber.
- FEM program for analyzing dispersion characteristics of a fiber with arbitrary refractive index profile.

SERVICE

- Chairman UG curriculum board under All India Council of Technical Education (AICTE)
- Member of Council of National Board of Accreditation (NBA), India.
- Member of Academic Council of Film and Television Institute of India, Pune (2010-2011)
- Member of Board of Management, National Institute of Food Technology, Entrepreneurship and Management, Delhi (2012-2014).
- Non-Executive Director and Member of Board of Governors, Engineers India Ltd. (2012-2014).
- Member of IIT Council, India.
- Chairman, Joint Entrance Examination for 2012 and 2013.
- Member of Standing Committee of IIT Council, India (2013).

- Invited Member of the Board of Governors of IIT Ropar, India.
- Member of Academic Council, Jawaharlal National University, New Delhi.
- Member of Research Council of National Physical Laboratory under Council of Scientific and Industrial Research (CSIR) India.
- Member of Academic Council, Allahabad University. India
- Member of Academic Council, Amaravati college of Engineering.
- Member of Board of Governors of Punjab Technical University. Chandigarh, India.
- Member of the Committee for Higher Education reforms in Maharashtra, India.
- Member of National Committee for Reforms in Technical Education in India.
- Chairman of PG curriculum in Electronics and Telecommunication under All India Council of technical Education.
- Chairman of UG curriculum in Electronics and Telecommunication under All India Council of technical Education.
- Member, ICT mission project of Ministry of Human Resource Development, India.
- National Principal Coordinator for developing e-learning learning material for entire curriculum in Electronics and Telecommunication Engineering.
- Member, AICTE committee for revision of National Board of Accreditation (NBA) norms according to the Washington Accord.
- Member of Accreditation team to NITs
- Expert Member, Selection committees of DTE, Mumbai University.
- Expert Member, IITs, NITs, DA-IICT, Gujrat University.
- Member, Academic Board, College of Engineering, Pune.
- Member, Academic committee for Electronics and Telecommunication, College of Engineering, Pune
- Member, Advisory Board, VJTI, Mumbai.
- Member, Academic Council, Babasaheb Ambedkar Technical University, Lonere.
- Member, Senate of SGGS College of Engineering, Nanded.
- Member, Advisory Council, KJ Somaiya College, Mumbai University.
- External Expert, Department of Technical Education, Maharashtra.
- Member, Research Advisory Committee, SAMEER, Bombay.
- Member, Board of Studies, University of Goa.
- Member of Departmental Under Graduate Committee, Department of Electrical Engineering IIT, Bombay.
- Member of Under Graduate Programme Committee of IIT, Bombay.
- External expert for DRDO (Defense research and development organization), over a period of 1991-1994.
- External expert for Goa, Public Service Commission.
- External expert for State Bank of India, Bombay.
- Examiner in GATE and other IIT's and Universities.
- Member of Scientific Advisory Committee SAMEER, Mumbai.
- External Expert for Indian Space Research Organization, Bangalore.

EXTRACURRICULAR ACTIVITIES

- Music : Bachelor of Music degree in Hindustani Classical music (Sitar) from Kheragadh Music University.
- Hindi Poem Writing
- Painting etc.

PUBLICATION

Books:

- *"Electromagnetic Waves"*, Published by McGraw Hill Education India, 2005. An Undergraduate textbook for Electronics and Telecommunication Engineering students.
- " Transmission Lines " Ed. with V. Ramachandran and K. Shankar, IETE Publication, Tata McGraw Hill 1998. A reference book.

e-Content :

- "Electromagnetic Waves and Transmission Lines", 60 Video Lectures, NPTEL, MHRD, Govt. of India 2007.
- "Fiber Optic Communication", 40 Video Lectures for a full PG course. IIT Bombay 2000.
- "Electromagnetic Waves and Transmission Lines", Interactive Web course for UG programme, NPTEL, MHRD, Govt. of India 2007.
- "Fiber Optic Communication" Interactive Web course for UG/PG programme, NPTEL, MHRD, Govt. of India 2007.

Academic Refereed Journals:

- Sarang Pendharker, R.K. Shevgaonkar and A.N. Chandorkar, "Optically Controlled Frequency Reconfigurable Band Stop Filter with Multi-frequency Switching", Microwave and Optical Technology Letters, Vol. 56, no. 5, May 2014.

- Sarang Pendharker, R.K. Shevgaonkar and A.N. Chandorkar, "Optically Controlled Frequency Reconfigurable Microstrip Antenna with Low

Photoconductivity", IEEE Antenna and Wireless Propagation Letters, Vol. 13, 2014.

- Shevgaonkar, R.K., 'Higher Education model for Developing Economies', Glion Colloquium, Switzerland, June 2013.

- Patil, P. B., Pendharker, S. and Shevgaonkar, R. K., "Electrical modeling of photonic crystal defects", Microwave Opt. Technol. Lett., volume 54, Issue 11, pp 2522–2528, November 2012.

- Bhangaonkar, A.S.; Kulkarni, S.V.; Shevgaonkar, R.K.; , "Study of the effects of alternating magnetic field on point-plane corona," , IEEE Transactions on Dielectrics and Electrical Insulation, vol.18, no.6, pp.1813-1820, December 2011.

- Padmaja Bhanu B., R. K. Shevgaonkar ; A. N. Chandorkar; "Propagation characteristics of plasmonic metal stripe waveguide". SPIE – Vol 8173, 81731L, 2010.

- P. B. Patil, R. K. Shevgaonkar, "Improved S-parameter Model for Photonic Crystal Defects", SPIE – Vol 8173, 81730E, 2010.

- Sanjay S. Pawar, R. K. Shevgaonkar and Abhay Karandikar, "Improved SAC-OCDMA System with Multiple Incoherent Sources", IEEE Photonics Technology Letters, vol 20, p. 2099-2101 (2008).

- Sanjay S. Pawar, R.K. Shevgaonkar and Abhay Karandikar, "A Novel Scheme to double the capacity of an SAC-OCDMA system", Submitted to Microwave and Optical Tech. Letters (2012).

- V.K. Gupta, P. Seshu, K.K. Issac, R.K. Shevgaonkar,'Optimal steering of a paraboloid antenna using piezoelectric actuators', Smart Materials and Structures, v 16, n 1, p. 67-75 (2007).

- A.E. Daniel, R.K. Shevgaonkar, " Uniform dual band array with optimum side lobe level", Microwave Opt. Tech. Lett., Vol. 3, p. 615 (2006).

- A.E. Daniel, R.K. Shevgaonkar, " Slot loaded rectangular microstrip antennas for tunable dual band operation ", Microwave Opt. Tech. Lett., Vol. 3, p. 441 (2005).

- R.K. Shevgaonkar, "Image Restoration in Radio Astronomy", Ann. Indian Nat. Acad. Engg., vol. 2, pp. pp.105-109 (2005).

- V.K. Gupta, P. Seshu, K. Kurien Issac, R.K. Shevgaonkar, "Beam Steering and

Shaping of Smart Cylindrical Antenna", AIAA Journal, vol. 43, pp. 165-173 (2005).

- S.K. Narayankhedkar, R.K. Shevgaonkar, "Inter-channel cross talk in fiber Bragg grating based Add/Drop multiplexer", Information Sciences-Informatics and Comp Sc., vol. 149, p. 53 (2003).

- Pallavi Manohar, D. Manjunath and R. K. Shevgaonkar, "Routing and Wavelength Assignment in Optical Networks from Edge Disjoint Path Algorithm, IEEE, Communication Letters, vol 6, p. 211 (2002).

- J. Ravikanth, D.D. Shah, R. Vijaya, B.P. Singh and R. K. Shevgaonkar, "Analysis of High power EDFA in Saturated regime at 1530 nm and its performance evaluation in a DWDM system", Microwave and Opt. Tech. Letters, 32, pp. 64-70 (2002).

- M.K. Bashar, N. Ohnishi, R.K. Shevgaonkar, "Cortex transform and its application for supervised texture classification of digital images", Proceedings of SPIE - The International Society for Optical Engineering, v 4567, p 141-152 (2001).

- S. K. Narayankhedkar and R. K. Shevgaonkar, "Performance Evaluation of WDM Data De-multiplexed using Grating Filter," To appear in J. of Optical and Quantum Electronics (2002).

- M.K. Bashar, N. Ohnishi, R.K. Shevgaonkar, "Cortex transform and its application for supervised texture classification of digital images", Proceedings of SPIE - The International Society for Optical Engineering, v 4567, p 141-152 (2001).

- S.K. Narayankhedkar, R.K. Shevgaonkar, "Performance evaluation of WDM Optical Network with Erbium doped fiber amplifier", Proc. SPIE 4417, pp. 222-233 (2000).

- J. Ravikanth, D.D. Shah, R. Vijaya, B.P. Singh and R. K. Shevgaonkar, "High power EDFA Analysis", Proc. SPIE 4417, pp. 396-402 (2000).

- S.P. Survaiya, R.K. Shevgaonkar, "Large Effective Area fibers for DWDM system", Proc. SPIE 4417, pp. 417-424 (2000).

- J. K. Patel, R. K. Shevgaonkar, "Analysis of Diffuse Indoor Infrared Data links", J. Optical and Quantum Electronics, 32, pp. 1319-1323 (2000).

- S. P. Survaiya, R. K. Shevgaonkar, "Dispersion Characteristics of an optical fiber having linear chirp refractive index profile", IEEE Transaction J. Lightwave Technology, Vol.17, No.10, pp. 1797-1805, (1999).

- K. R. Suresh Nair, B. Singh, Y. G. K. Patro, R. K. Shevgaonkar, "Mode size measurement of integrated optic channel waveguide at 1310 nm wavelength", Communication in Instrumention, vol. 6, pp. 25-33, Jan (1998).

- K. R. Suresh Nair, Y. G. K. Patro, R. K. Shevgaonkar, "Mode size studies on polarization variation in Titanium-diffused z-cut Lithium Niobate Channel Waveguides", Microwave and Opt. Tech. Letters, Vol. 19, pp. 448 - 451 (1998).

- N. Rajput, R.K. Shevgaonkar, "Selection of Transforms for better Image Compression", SPIE Proc. Vol. 3460, pp. 468-477 (1998).

- K. R. Suresh Nair, Y. G. K. Patro, R. K. Shevgaonkar, "Studies on Design of Titanium Indiffused Lithium Niobate Integrated Optic Channel Waveguides and Directional Couplers", J. of Optics, vol 27, No.3, pp.121-138, July - Sept. (1998).

- S. P. Survaiya, R. K. Shevgaonkar, "Dispersion Compensating fiber without using Higher Order mode over the EDFA window", J. of Optics, vol 27, No.3, pp.139-146, July - Sept. (1998).

- R.C. Agrawal, S.C. Sahasrabudhe, R.K. Shevgaonkar, "Preservation of Topological properties of a simple closed curve under digitalization", J. Comp. Vision and Image Understanding, Vol. 67, No. 2, pp. 99-111 (1997).

- K. R. Suresh Nair, Y. G. K. Patro, R. K. Shevgaonkar, "Titanium indiffused Lithium Niobate integrated optic 2 x 2 switch", IETE Journal (1997).

- K. R. Suresh Nair, A. Bhatnagar, Y. G. K. Patro, R. K. Shevgaonkar, "Fiber attachment and packaging of integrated optic directional coupler at 1300nm wavelength", J. of Optics, Vol. 26, pp. 73-77 (1997).

- S. P. Survaiya, R. K. Shevgaonkar, "Design of Subpicosecond dispersion - flattened fibers", IEEE Photonics Tech. Letters, vol-8, No.6, pp. 803-805 (1996).

- R. C. Agrawal, R. K. Shevgaonkar, S. C. Sahastrabudhe, "A fresh look at the hough transform", Pattern Recog. Letters, vol.17, pp. 1065-1068 (1996).

- A. Goel, R. K. Shevgaonkar, "Wideband dispersion compensating optical fiber", IEEE Photonics Tech. Letters, vol.8, No.12 (1996)

- Malik, R., Shevgaonkar, R. K., Ananthakrishnan, S., "High resolution digital spectrometer for studying Solar radio burst", J. Inst. Engrs., vol-72, p. 137 (1992).

- Alissandrakis, C. E., Kundu, M. R., Shevgaonkar, R. K., "VLA observations of

Solar active regions at 6 to 20cm", Astron Astrophys., 251, p. 276 (1991).

- Deshpande, A. A., Shevgaonkar, R. K., and Sastry Ch. V., "The Decametre Radio Telescope at Gauribinur: Antenna array and its control system", IEEE vol. 35, (1990)

- Shevgaonkar, R. K., and Kundu, M. R., "Time variability of Solar active regions at
- centimetric wavelengths", Astrophys. J., 342, p. 586 (1989).

- Shevgaonkar, R. K., Kundu, M. R., and Jackson, P. D., "Variability of the metric emission from the Sun", Astrophys. J., 329,p. 982 (1988).

- Kundu, M. R. and Shevgaonkar, R. K., "Detection of dMe flare star YZ Cains Minor simultaneously at 20 and 90cm wavelengths", Astrophys. J., 334, p 1001 (1988).

- Shevgaonkar, R. K. , "Maximum entropy method for polarized images", Astron. Astrophys., 176, p 159 (1987).

- Kundu, M. R., McConnell, D., White, S. M., and Shevgaonkar, R. K., "Very Large-Array observation of a complex gradual Solar burst at 6cm wavelength", Astron. Astrophys., 176, p 131 (1987).

- Webb, D.F., Holman, G.D., Davis, J.M., Kundu, M.R., Shevgaonkar, R.K., "The plasma and magnetic field properties of coronal loops observed at high spatial resolution", Astrophys. J., 315, pp. 716-728, (1987).

- Kundu, M. R., Melozzi, M., Shevgaonkar, R. K., "A study Solar filaments for high resolution microwave observations", Astron. Astrophys., 167, p. 166 (1987).

- Shevgaonkar, R. K., "Maximum entropy method for phase unstable aperture synthesis", Astron. Astrophys., 162, p 349 (1986).

- Shevgaonkar, R. K., "Minimum relative entropy method - a solution to missing short baseline problem", J. Astrophys. Astron., 7, p 275 (1986).

- Hebbal S.R., Ronan, R.S., Withbrow, G.L., Shevgaonkar, R.K., Kundu, M.R., "Solar Coronal brightpoints observed with the VLA", Astrophy. J., 306, pp. 740-750 (1986).

- Shevgaonkar, R. K., and Kundu, M. R., "VLA observations of a radio plage at centimeter wavelengths", Solar Phys., 98, p 119 (1985).

- Kundu, M. R. and Shevgaonkar, R. K., "Microwave emission from late type

dwarf stars UV Ceti. and YZ canis Minor", Astrophys. J., 297, p 644 (1985).

- Melozzi, M., Kundu, M. R., and Shevgaonkar, R. K., "Simultaneous observations of Solar flares at 6 and 20cm wavelengths using VLA", Solar Phys., 97, p 345 (1985).

- Kundu, M.R. and Shevgaonkar, R. K., "Microwave emission from late type dwarf stars UV Centi and YZ CMi", Astrophys. and Space Sci. Lib., 'Radio Stars', 116, p 229 (1985).

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- Shevgaonkar, R. K., "Maximum Entropy Method for low frequency mapping", Proc. NARO Symposium on ' Low frequency astronomy held at Green bank, USA (1984).

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- Shevgaonkar, R. K. and Paul, D. K., "Wave propagation in an over-sized anisotropic optical fibre", XIth IETE Symposium held at New Delhi (1977).

- Paul, D. K., and Shevgaonkar, R. K., "Hybrid mode characteristics of an anisotropic dielectric optical fibre", XIth IETE AP Symposium held at New Delhi (1977)

Ph. D. THESES GUIDED :

- Some Aspects of Digitalization. (R.C. Agrawal)
- Analysis and Development of Lithium Niobate 2 x 2 active switch. (K.R. Suresh Nair)
- Moment method analysis of MIC Tapered slot antenna. (P.S. Sonare)
- Low Dispersion Fibres for WDM Applications. (S.P. Survaiya)
- Electromagnetic scattering from thin elliptical discs. (Saumya Adhikari)
- Image Representation by blobs. (Anoop Kulkarni)
- Wavelength Division Multiplexed Fiber Optic Link using Erbium Doped Fiber Amplifier. (S.K. Narayankhedkar)
- Quasi-optical microwave power combiner. (A. Agrawal)
- WDM pulsed Fiber laser source. (D.D. Shah)
- Tunable Dual band Microstrip Antennas (Asha Elizabeth)
- Investigation of Optical Spectrally coded CDMA systems (Sanjay Pawar)
- Photonic Crystal Devices (Preeti Bhamre Patil)
- Optically Reconfigurable Microwave Devices (Sarang Pendharker)

Ph. D. Dissertations under progress :

- EMI/EMC mitigation studies (Sulabha Ranade)
- Plasmonic optical filters (Padmaja Bhanu)
- Wireless Communication (Anshu Mittal)

M.Tech. Dissertations Guided (Partial list) :

- Pattern recognition of typed of handwritten characters. (1990)
- A rule based expert system for image classification. (1991)
- Restoration of Images obtained form the projection data. (1991)
- Computation of Images obtained from Projection Data (1991)
- Shape Registration (1992)
- Design of a network interface for IBM PCs. (1992)
- Low noise high power transmitter in pulsed Doppler radar. (1993)

- Study of the dispersion characteristics of an optical fibre using FEM. (1994)
- Restoration of radio astronomical images. (1994)
- Multi-scale shape analysis recognition. (1995)
- MIC tapered slot antenna.(1995)
- Study of Dispersion Compensation for WDM Optical Fiber Links (1996)
- Inter-channel cross-talk in WDM Fiber Optic System. (1997)
- Moment method Analysis of printed Log-Periodic Dipole Antenna. (1997)
- Analysis of Printed Dipoles using Method of Moments (1997)
- A Hindi Script Reading System (1998)
- Adaptive Image Compression Using Non-orthogonal Transforms (1998)
- Digital Image Segmentation based on Textural Cues (1998)
- Feature Extraction in Fingerprints and their classification (1998)
- Wavelength Division Multiplexed Fiber Optic Link (1998)
- Hindi Script Reading System (1999)
- Simulation of Wireless Infrared Link (1999)
- Performance Evaluation of WDM System (1999)
- Active Contour Models for Detection of Linear Features in Satellite Images (1999)
- Automatic Signature Recognition (1999)

B.Tech. Projects Guided :

- Development of a PC compatible general purpose program to compute the Antenna
- characteristics. (1989)
- Design and fabrication of microstrip antenna. (1989)
- Propagation characteristics of an over sized anisotropic optical fibre. (1989)
- Non-Coherent MTI radar and clutter properties of radar systems. (1990)
- Low frequency radio astronomical modelling of the Ionosphere. (1990)
- Rectangular cross-section anisotropic optical fibres directional coupler. (1990)
- Image Restoration of long exposure images observed through a time varying screen. (1990)
- Analysis of coupling between two parallel anisotropic fibres of circular cross section. (1990)
- Adaptive arrays for multiple target tracking. (1991)
- Phased arrays using anisotropic optic fibres. (1991)
- Voice link using optical fibre. (1991)
- Full duplex RS-232C fibre optic link. (1991)
- Character recognition using Zorknite moments. (1992)
- Design and fabrication of Ultra high Frequency Voltage Controlled Oscillator (1992)
- Registration of synthetic aperture radar images. (1992)
- Bionomal transformer in MIC form (1993)

- Image restoration using Neural Network. (1993)
- Image restoration using Hough Transform. (1993)
- Development of CAD package and amplifier design at radio frequency. (1993)
- Light wave propagation in Non-linear optical fibre. (1994)
- Non-linear Optics (1994)
- Restoration of aperture function using constrained least square minimization. (1994)
- Handwritten character recognition using Moments invariant. (1994)
- Optically excited semiconductor antennas.(1995)
- Digital communication through optical fibre link. (1995)
- Cursive script recognition. (1995)
- Non linear fibre optics.(1995)
- Non linear fibre optics.(1996)
- Edge Detection using Morphological State Space (1996)
- Digital Communication using Optical Fiber (1996)
- Wavelength Division Multiplexing in Optical Fiber Communication (1996)
- Text Recognition of Devnagri Script (1997)
- Non-linear Crosstalk Analysis in Wavelength Division Multiplexed Optical Fiber Link (1997)
- Image Reconstruction from Projections (1998)
- Rotational and Scaling invariant image matching (1998)
- Simulation of WDM Link (1998)
- Fading Channel modeling for mobile communication (2000)
- Optically controlled microwave devices.

Postgraduate Courses Taught :

- **Fiber Optic Communication :** An advanced course on linear and non-linear fiber optic communication. The course covers propagation of light in optical fibers, Lasers, detectors, fiber optic links, integrated optical devices- directional couplers and switches, non-linear optics - SPM, XPM, Soliton propagation, Raman amplification, Erbium doped fiber amplifier, Wavelength Division Multiplexed systems.

- **Image Processing :** A broad-based course on principles of image processing covering Image representation, various transforms, Image enhancement, Restoration, Compression, Segmentation, Registration and Image analysis.

- **Fiber Optic Laboratory :** The laboratory has experiments on fibers like NA measurement, Mode launching, Microbending loss measurement, LED/Laser characteristics, Fiber digital communication like with voice and data multiplexed. Optical fiber splicing and connectorization etc.

- **Digital Signal Processing** : Linear systems, Z- and Fourier Transforms, FFT,

Frequency response, DSP architectures, FIR, IIR filter designs, Linear phase filters, DSP algorithms, DSP applications.

- **Radio Astronomy**: Introduction to astronomy, Coordinate systems, Radiation processes like bremsstrahlung, cyclotron, synchrotron etc, Radio telescopes- Total power and correlation type, Aperture synthesis techniques, Image processing techniques for radio astronomy, Observations of radio sources like, the Sun, supernova remnants, pulsars, radio galaxies etc.

Undergraduate Courses Taught :

- **Electromagnetic Waves:** A fundamental course on time varying fields, Transmission lines, Wave propagation, Waveguides and Antennas.

- **Communication System :** A basic course on communication covering - Fourier transform, Amplitude, Frequency and Phase Modulation and Digital Modulation Techniques.

- **Analog Circuits :** A basic course on linear active circuits covering BJT, FET, based electronics circuits and OPAMP based circuits.

- **Basic Electronics :** An introduction course on electronics covering types of devices, Amplifier, filters, Oscillators, Rectifiers and digital electronics circuits.

- **Microwave and Optical Communication :** An advanced course covering satellite orbits, Earth stations, TDMA, FDMA, CDMA, CSMA etc, and Fiber optic communication - Optical fiber analysis, Lasers, Detectors, Fiber optic systems, Integrated optical devices, Fiber optic links.

- **Data and Telecom Transcievers:** The course covers the physical layer aspects of high speed transmission covering aspects of noise, signal distortion, PLLs, frequency synthesizers, data and clock recovery circuits, antenna systems for mobile communication.