Dr. Gajanan D. Nagare

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Objective

Seeking an entry-level/experienced lithography process engineer position in the Nanofabrication area.

Education

Ph.D.
Indian Institute of Technology Bombay, India.
2004-2010
M.E.
Government college of Engineering Pune, India.
2000-2003

MEMS Research Experience (+2 Years)

Visiting research Scholar (From June 2011)
IIT Bombay, India
Associate professor (August 2011)
VIT, Mumbai, India
Postdoctoral Fellow (1st October 2010-May 2011)
University of Alberta, Canada
Research associate (2009-2010)
Indian Institute of Technology Bombay, India
Senior Research Fellow (2008-2010)
Indian Institute of Technology Bombay, India

MEMS Skills

Nano-fabrication tools
Electron beam lithography (JEOL 6400, e-LiNE, Raith 150 and Raith 150TWO), optical lithography, reactive ion etching system, dielectric and metal sputter, hot-wire CVD, PE-CVD, ICP-CVD and thermal evaporation system.
Characterization tools
Scanning electron microscope, Ellipsometer, profilometer, atomic force microscope, fluorimeter, UV-VIS spectrometer, fluorescence microscope, Raman spectrometer, Mercury probe with IV setup, contact angle instrument and FTIR spectrometer.
Simulation tools
CoventorWare and RSoft (DiffractMOD™ and BeamPROP™)

Nanofabrication/ process achievements and Exposure

GMRF structure optimization using DiffractMOD^{TM} R-Soft tool.
MZI design by BeamPROP^{TM} RSoft tool.
Preliminary design of MEMS structures using CoventorWare.
Optimization of high-k deposition systems parameters for Stochiometric Silicon nitride films using HW-CVD, ICP-CVD and High-k Sputter.
Tuning dielectric and surface properties of MEMS polymers namely HSQ, SOG and PDMS by optimizing the process parameters.
Optimization of resist thickness and EBL dose for patterning 100 nm binary lines on silicon nitride deposited substrates.
Proximity effect study and corrections for EBL patterning.
MEMS process development for microfabrication of grating structure on dielectric substrates using TCL approach by using EBL.
Standardization of RIE recopies for anisotropic etching of silicon nitride, glass and silicon substrates.
Optimization of PMMA processing to use as a mask for etching glass.
MEMS fabrication of SU8 waveguides array with beam splitter made using photolithography system.
Development and Optimization of exposure parameters of Interference lithography setup for patterning grating structures.
MEMS fabrication of microfluidics channel using double exposure of EBL by standardizing dose variation protocol.
MEMS process development for 3D SU8 MEMS structures for stress measurement.
Soft lithography technique for mass replication of PDMS microfluidics channels.
MEMS fabrication of MOS, ID electrodes and comb structure for multidisciplinary application.
MEMS process development for RF MEMS switch.
MEMS fabrication of SiNx and SiO_x cantilevers.
MEMS process development for mimic of porous media for microfluidics application.

Additional responsibilities and duties

MEMS Process coordinator, Indian Nanotechnology User's program, IIT Bombay (2010)
MEMS processes development for different projects of CMOS, FET, MOSFET, Solar cells, and multidisciplinary research.
Student Lab-In-charge, Centre for Nano-Electronics laboratory, IIT Bombay (2008-2009)
It involves site preparation for new instruments, installation of newly arrived instruments, maintaining clean room discipline in the lab, updating the policies for the lab users (internal and external), training newcomers in the laboratory, maintaining equipment and arranging for repairs and managing the man power to accomplish tasks.
Research fellow, Center of Excellence in Nanoelectronics, IIT Bombay (2008-2009)
It involves process development and scheduling fabrication processes for the completion of time bounded research in different fields
EBL expertise (2008-2009)
e-LiNE system optimization at Center of Excellence in Nanoelectronics (IISc Bangalore)
Volunteer for IWPSD conference held in IIT Bombay, (2007-2008)
Placement representative (2003-2004)

Instrumentation Department and assistant placement officer at D.Y P.I.E.T, Pune
Organizing Member (2003-2004)
Short term training program at DYPIET, Pune.
Library Secretary (2000-2002)
Instrumentation and control Department in M.E at Government college of Engineering, Pune.

Publications

International conference

Manoj Joshi, Gajanan Nagare, Seena V., V. Ramgopal Rao, Soumyo Mukherji, "Functionalization of Hydrogen Silsesquioxane (HSQ) surface for biosensor applications", Proceedings of the European Materials Research Society (EMRS)Spring Meeting, MAY 28 to JUNE 1, 2007, Congress Center - STRASBOURG (France)

Gajanan Nagare, Soumyo Mukherji, "Regeneration of bio-functionalized SOG Surface", 10th International Conference on Advanced Materials, IUMRS- ICAM October 8 to October 13, 2007, Bangalore (India)

Gajanan Nagar and Soumyo Mukherji, "Fabrication of GMRF device using direct electron beam lithography on insulator", ECS conference, May 2011, Montreal, Canada

Gajanan Nagare, Soumyo Mukherji and Sushanta Mitra, "Photonic Crystal based Biosensor with inbuilt Nano-fluidics channels", ECS conference, May 2011, Montreal, Canada

Published journal paper

Gajanan Nagare, Soumyo Mukherji, "Characterization of silanization and antibody immobilization on spin-on glass (SOG) surface", vol. 255, Issue 6, 2009, Pages 3696-3700, Applied Surface Science.

Publications under review

Gajanan Nagare, Soumyo Mukherji, "Tuning of SOG dielectric properties for optical device", submitted to Sensors Journal.

Gajanan Nagare, Soumyo Mukherji, "GMRF based biosensor", Biosensors and bioelectronics.

Gajanan Nagare, Soumyo Mukherji, "Effect of grating thickness and refractive index contrast on spectral response of single layer GMRF sensors", optical communication.

Intellectual property protection

Polymeric MZI design for higher sensitivity (Under review: TEC Edmonton)
Double optical device for effective detection (Under review: TEC Edmonton)

References

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