Sarang Kortikar

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Objective

Seeking a challenging position in field of MEMS and Nanotechnology in areas such as process development, device fabrication, characterization, and simulation, which will provide the opportunity to utilize my organizational and design skill in improvement of the device.

Career Summary

- **3+ years of Experience** as **Process development engineer**
- **MS Mechanical Engineering** with specialization in **System Design and MEMS**
- Expertise in **UV Lithography**, **Mask design layout, Mask Alignment** and **Dry/Wet Etching** processes.
- Through knowledge of **UV**, **Deep UV**, **E-beam Lithography**, **X-Ray Synchrotron**, **LIGA** and Soft **Lithography** techniques.
- **Process improvement** using **DOE and SPC techniques.**
- Develop **Solid models** using Ideas 11.0, Solid works.

Education

- **M.S.** Mechanical Engineering, University of Kentucky, KY ***December 2004***
- **B.E.** Production Engineering, Shivaji University, India ***June 1997***

Research Experience

Research Assistant, *Bearing and Seals Laboratory, University of Kentucky,* ***Aug 2001 – Dec 2004***

- **Designed and developed Photolithography process** suitable for mass production of thrust surface.
- Performed **material research**, photo resist selection, etching conditions, **design of experiments**, planning and execution of experiments, along with failure analysis of experiments.
- **Design photomasks** of different aspect ratios to fabricate microaperities.
- Develop a **Novel Alignment Technique** for **alignment of mask and substrate**-using EDM marks on substrate and photmask.
- **Process variables** such as resist thickness, spin coating, baking, post baking, using **Principles of DOE** techniques controls exposing.
- Performed **Surface characterization** of micro-asperities using Optical Interferometer [non-contact type], Stylus Profilometer (Contact type -Dektak), Scanned electron microscopy (**SEM**) and **AFM** (Atomic Force Microscope).
- **Presented and published research paper** on fabrication and characterization of deterministic microasperities in International Conference [ASPE].
- Generated the analytical models for determining coefficient of friction and compared the results with experimental results.

Research Assistant*, Photonics Lab, University of Kentucky,* ***August 2003- December 2004***

- Developed the electrodeposition process on Biosensor to improve electrical properties of biosensor.
- Performed measurement of various electrical properties of platinum plated biosensor such as electrical impedance, capacitance using Impedance Analyzer.
- Surface characterization of Biosensor using Stylus profilometer (Dektak), Scanning electron microscope (SEM) and Atomic force microscope (AFM).
- Created a customized data acquisition for biosensor using Lab view software.
- Presented poster publication in Journal of Neuroscience, October 2004, San Diego.

Masters Thesis [MEMS /Lithography Focus]

"Fabrication and Characterization of Deterministic microasperities on thrust surface" December 2004.

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Publication and Presentation

- **Kortikar, S**., Stephens, S., Siripuram R., Hadinatha P., " Manufacturing of microasperities on thrust surfaces using UV lithography process", Conference Proceeding of winter tropical meeting ASPE, Volume 18, Jan 2003, P.148-153**.**
- T.D.Coates,Jr.;**S.Kortikar**;J.J.Burmeister;J.T.Hastings;P.Huettl;F.Pomerleau;G.A.Gerhardt, "Nanostructured microelectrode arrays for improved spatial resolution and sensitivity for rapid in Vivo electrochemical recordings", Presented Poster in Society of Neuroscience, San Diego, Oct 2004.
- **Kortikar S;** Stephens S; "Fabrication and Characterization errors in the deterministic microasperities on thrust surface", In preparation to be submitted to the Journal of Micro Electro Mechanical Systems.

Microfabrication Skill Sets:

- **Silicon Micromachining:**
  Photolithography: SU8 2050, Shipley 1813 resist, wet etching (acetone), Dry etching (Plasma), oxidation.
- **Metal deposition:**
  Thermal evaporator (Aluminum), E-beam evaporator (Copper, Gold)
- **Electroplating:**
  Nickel, Platinum smooth, Platinum black
- **Polishing techniques:**
  Lapping, Chemical Mechanical Planarzation [CMP]
- **Metrology:**
  3-D Surface Profilometer, Scanned Electron Microscope (SEM), Atomic Force Microscope [AFM]

Computer Skills

- CAD Software: AutoCAD 2004, IDEAS 11.0, Pro-E, Ansys 8.0, Femlab.
- Operating System: Windows Xp, UNIX.
- Softwares: Matlab 6.5, Visio, Sigma Plot.
- Programming Language: C

Projects

- **Nanoimprint Lithography**: Various polymers used in process are studied. Patterns generated on silicon wafer using UV lithography process and Conceptual design of Nano-press is proposed.
- **Platinum electroplating**: Microelectrode is plated with Platinum (smooth) and Platinum black by varying the process conditions. The coated electrode is characterized by SEM (scanned electron-scope) and AFM (Atomic force microscope)
- **Stresses in Mechanical Seal:** Built a finite element model of mechanical seal and performed stress analysis in mechanical seal.
- **Flow pattern in duct pipe: Did flow analysis of** duct pipe using **FEA software** and studied flow patterns.
- **Rapid prototyping of centrifugal pump:** Created wax mold using rapid prototyping model.

Professional Experience

Project Engineer, MTH Tool Company, Plano, IL ***January 2005- Present***

- Hydraulic design of regenerative turbine and centrifugal pump
- Experience in Geometric Dimension and Tolerancing.
- Technical negotiation and Interaction with customers, vendors.
- Rapid prototyping and solid modeling of parts.

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Product Engineer, Kirloskar Brothers Limited, India ***September 1997 – June 2000***

- Design of **Centrifugal pumps, process pump** and vertical turbine pumps.
- Analysis and development of **solid models** using finite element analysis software such as **Pro-E, Ansys 8.0**
- Successfully **executed turnkey project onsite**.
- Performed cost estimation and scheduling of turnkey project.
- Complied relevant documentation as **ISO 9001, ISO 14001** requirements.

Project Engineer, Kishor Pumps Limited, India ***July 2000 – July 2001***

- Prepared **techno-commercial bids** for rotating equipments
- **Technical negotiations with customer.**
- Executed order from receipt of purchase order to dispatch by coordinating with various departments.
- Resolved **customer complaints** onsite**.**

Honors and Memberships

- Received Kentucky Graduate Scholarship from engineering department at University of Kentucky.
- Member of American Society of Mechanical Engineers,(ASME)

References available on request