

# Dhananjay Bodas

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## Objective

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Polymer microfabrication technology is the field of work for 6 years. Expertise in handling of special instruments for micro-nanofabrication and characterization. Excellent track record demonstrated by number of research publications. Strong inclination towards creative and goal oriented research.

## Qualification Highlights

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- Reviewer for Journal of Applied Polymer Science, Plasma Processes and Polymers, Journal of Micromechanics and Microengineering and Journal of Colloids and Interface Science
- Prestigious Alexander von Humboldt Research Foundation Scholarship
- Postdoctoral Scholarship awarded by French Ministry of Research

## Experience

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Institute for Microsystems technologies, Freiburg, Germany Jul. 2006 - Present

### Postdoctoral Scientist/Visiting Research Scientist

- Bio-Disk Project: Ultra hydrophobic surfaces for use as hydrophobic valves.
- To develop instrument for controlling and precise positioning of hydrophobic patches
- Hotembossing of COC, Lamination for sealing microchannels. Training on standard photolithographic instruments and thickness measurement setup

Institute of Bioengineering and Nanotechnology, Singapore Mar. 2006 - Jun. 2006

### Research Scientist

- GeneCD: DNA and gene synthesis device on centrifugal microfluidics platform.
- Microfabrication of PCR chips and error filters for the same. Design of micro valves for liquid flow control.
- Acquired skills on hotembossing and sealing of PC, COC and PMMA on a CD platform.
- Study on bonding for PDMS-PDMS, PDMS-PC and PDMS-PMMA

FEMTO-ST/CNRS, Besancon, France Oct. 2005 - Feb. 2006

### Research Engineer

- Polymer microfluidic system for the analysis of biological macromolecules
- Micro-contact printing using PDMS stamps for local surface modification.
- Nanofluidics using Focused ion beam. Nanoembossing technology using hot press

FEMTO-ST/CNRS, Besancon, France Nov. 2004 - Sep. 2005

### Postdoctoral Scientist

- Polymer microfluidics
- Major accomplishments on surface modification of PDMS by various routes.
- Acquired expertise in soft lithograph and photolithography.

Georgetown University, Georgetown, Washington Aug. 2003 - Oct. 2003

### Short-term research scholar

- Polymer MEMS based pressure sensor for human pulse measurement
- Design, development, fabrication and characterization of SU-8 based pressure sensor with piezoelectric sensing mechanism
- Polymer microfabrication using photolithography. Gained know-how of sputtering systems for metal deposition for contacts.

## Education

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**Doctorate, Microelectronics** Sep. 2004  
University of Pune, Pune, India - "Development and Characterization of novel masking materials (polymers) for silicon micromachining"

**M.S., Applied Physics**

Jun. 1999

MS University, Baroda, India - Stood Second at University level examination

**B.S., Physics**

Jun. 1997

MS University, Baroda, India

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**Skills**

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- Instrument handling: Focused ion beam (FIB), e-beam and standard photolithography, Reactive ion etching (RIE), deep RIE, anodic bonding system, hot-embossing system, activated reactive evaporation, dc/rf and magnetron sputtering systems, oxidation furnace, mask aligner, wet and dry etching etc.
- Surface modification: Surface modification by UV/ plasma grafting, spin coating etc.
- Testing and characterization morphology: SEM, AFM, EDX
- Spectroscopy: ATR-FTIR, UV/Vis, XPS (ESCA)
- Surface properties: contact angle measurements, ellipsometry, Dektak
- Computer literacy: Efficiently handle documents, presentations and graph plotting software. Worked with CoventorWare, ANSYS, ACES, SIMODE and L-EDIT for MEMS design & analysis. Can work with C, C++, VB 6.0 and HTML programming languages. Can work with AutoCAD, Corel, Gimp etc
- Scientific writing skills: Research papers to scientific and peer reviewed journals/conferences and project reports

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**Selected Publications**

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"Hydrophilization and hydrophobic recovery of PDMS by plasma and chemical treatments-An SEM investigation." Sens. and Actu. B. 2007, In Press

"Capacitance-voltage characterization of electron beam induced surface crosslinked functional monomers." Appl. Phys. Lett. 2007, 90

"Fabrication of long term hydrophilic surfaces of poly(dimethyl siloxane) using 2-hydroxy ethyl methacrylate." Sens. and Actu. B. 2007, 120, 719-723

"PMMA as a masking material for MEMS fabrication." J. Appl. Polym. Sci. 2006, 102, 2094-2098

"Formation of more stable hydrophilic surfaces of PDMS by plasma and chemical treatments." Microelec. Engg. 2006, 83-84, 1277-1279

"Deposition of plasma polymerized hydroxyethyl methacrylate (HEMA) on silicon in presence of argon plasma." Appl. Surf. Sci. 2005, 245, 186-190

"RF sputtered poly(tetrafluoro ethylene) – A potential masking material for MEMS fabrication process." J. Micromech. Microengg. 2005, 15, 1102-1113

"Plasma treated polymer as humidity sensing material-A feasibility study." Sens. and Actu. B. 2004, 98, 37-40

"Tailor-made functional surfaces: potential elastomeric biomaterials-I." J. Biomater. Sci. Polym. Ed. 2003, 14, 1323-1338

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**Training**

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- Fabrication of microfluidic devices for biomedical applications, EPFL, Lausanne, Switzerland, 2005
- Sensors: Theory and Applications, Shivaji University, Kolhapur, India, 2003

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**Honors and Awards**

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- Research Scholarship, Alexander von Humboldt, Germany, Jul. 2006 - Aug. 2007
- Postdoctoral Scientist, French Ministry of Defense, France, Nov. 2004 - Oct. 2005
- Senior Research Scholarship, CSIR, India, India, Jul. 2002 - Jun. 2005
- Junior Research Scholarship, DRDO-ISRO, India, Apr. 2000 - Mar. 2002
- Research Scholarship, MS University, India, Aug. 1999 - Jul. 2000