

# Curriculum Vitae

## Mr. Viney Ghai

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### Professional Qualification:

- Pursuing PhD in Mechanical at Indian Institutes of Technology Ropar, Rupnagar.
- Secured 80.47% in M.E(Production Engineering),Thapar University, Patiala
- Secured 76.20% in B.Tech (Mechanical Engineering) Punjabi University, Patiala.

### Technical Skills:

- *Programming Languages* C, C++
- *Design Software* Pro-E, Solids-works, Ansys, Comsol

### Field of Interest:

- Nano Finishing, Nano Fabrication, Micro-Nano Manufacturing, Nano Texturing and Metamaterial

### Project Work:

- Working as project trainee at Bhabha Atomic Research Centre (BARC), Mumbai from 1<sup>st</sup> January to 31<sup>st</sup> July 2015.
  - *Study and Analysis of CMMRF for Nano Finishing of Aluminium Alloy*
    - a) Process of finishing of Al 7075-T6 and Al 6061 using CMMRF has been developed and optimised.
    - b) Defect free surface finish of the order  $8\text{\AA}$  ( $0.0008\mu\text{m}$ ) has been obtained.
    - c) Change of contact angle with roughness has been studied and super hydrophilicity was observed.
  - *Manufacturing of Micro-Dies for micro channels, micro cavities, micro wells and formation of micro pillars using Electroforming.*
    - a) Copper was plated on Al plate using electroplating process, and then both sheets were separated mechanically.

- b) Shape and size of micro die formed has been studied and optimised.
- c) A matrix of 100 micro pillars ranging from diameter and depth of 100  $\mu\text{m}$  to 1000 $\mu\text{m}$  has been generated with plating. And then copper metal carrying matrix was separated from Al and studied.
- d) Relation between pillar depth and has been studied and reported. Depth and diameter cause the formation to be a pillar or tube.

➤ ***Characterization of single spark Micro-EDM***

- a) Single spark EDM was characterized. The experiments were performed to evaluate the volume of material removal in both electrode as well as work-piece.
- b) Tools used having contact point of less than 10  $\mu\text{m}$ .
- c) Shape and of micro-cavity formed in the work-piece were also calculated. It was found that with constant capacitance volume removal is exponential and with constant voltage volume removal is linear.

- Worked as project trainee at BARC Mumbai from 1st January to 30th April 2013.

➤ ***Development of Intrinsic Fabry–Perot interferometric (IFPI) sensor***

- a) We developed and calibrated a fiber optics based Intrinsic Fabry–Perot interferometric (FPI) sensor for temperature and strain measurement.
- b) Insertion loss in sensor were calculated as of 0.1177, and response was verified from -25°C to 160°C having standard deviation of 2.552 nm.

➤ ***Development of Micro-drilling techniques in glass for lab on chip applications***

- a) The Micro-drilling in glass sheet was carried for lab on chip application, different methods tried for surface having crack and chipping free, and new method of micro-drilling in glass sheet was developed.
- b) Hole of 0.5mm (500 $\mu\text{m}$ ) was drilled using carbide drill bit, and defect free surface i.e. without any chipping or cracks was obtained.

➤ ***Design of Micro-pumps for Lab on Chip applications***

- a) Micro-pump was designed for Lab on Chip application. Material was selected for the construction of micro-pump and finite elements method was applied on all the different materials.
- b) The material giving best results was acrylic, and was selected for the micro-pump and then all the parts of micro-pump were prepared. Assembly and working part was to be checked for the micro-pump.

➤ ***Experimental investigation of cutting parameters influence on cutting forces and surface roughness in Micro-turning***

- a) Experiments were done to investigate the cutting parameters influence on cutting forces and surface roughness in micro-turning of titanium.
- b) Experiments were performed and data was recorded and evaluated with different cutting conditions. Finite element method was performed to verify the data.

- Worked as project trainee at University College of Engineering, Punjabi University Patiala from 30th May to 1st July 2011.

➤ ***Handling Fabrication Projects, Mechanical Tools and Machines***

- a) Grasped fundamental concepts of Mechanical and some basic level projects were undertaken.

- Worked as project trainee at Punjab State Electricity Board from 2nd July to 30th July 2009.

➤ ***SLDC on SCADA Systems***

- a) Grasped fundamental concepts of Electronics and some basic level projects were undertaken.

**Workshop Attended:**

- Attended workshop on "Postgraduate level training programme on differential equations" by NPDE-TCA 2016 at Indian Institute of Technology Ropar from May 16 to June 4, 2016.
- One week short term course on "Micro Manufacturing" from 29<sup>th</sup> June 2015 to 3<sup>rd</sup> July 2015 at IIT Kanpur.
- One day workshop on "Simulation of Engineering System" held on August 19, 2013 at Thapar University, Patiala.
- One day workshop on "Current R&D in Mechanical Engineering" held on August 23, 2013, at Thapar University, Patiala.

**Publications:**

- "Development of Intrinsic Fabry Perot Interferometric Sensor based on a Single Mode -Multi Mode-Single Mode (SMS) Configuration" by Rathod A., Ghai V., Parmar P., Mishra S., Ghildiyal S., Ranjan P. and Balasubramaniam R., in the Proceedings of 8th International Conference on Precision, Meso. Micro and Nano Engineering (COPEN-8), NIT Calicut, Dec 13-15, 2013, pp768-771.

### **Awards & participation:**

- 3-days skill development program on energy access by NISE, MNRE, Govt. of India from 17-19 November, 2015
- Placement representative of M.E production in Thapar university from 2013-2015.
- Winner of “Paper Presentation” event at State Level held at Guru Nanak Dev Polytechnic College, Ludhiana, Punjab, India.
- Joined “National Service Scheme” held at Punjabi University Patiala, Punjab
- Participated at various college functions such as Fresher’s Party, Fete, and Fests etc.

### **Strength and Skills:**

- Hard working, sincere, punctual and self-motivated.
- Leadership Qualities, Good communication skills and adept at grasping things.

### **Hobbies:**

- Swimming, visiting spiritual places, badminton and teaching.

### **References:**

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### **Declaration:**

- I hereby declare that the particulars given herein are true and complete to the best of my knowledge and belief.

Viney Ghai