

# CURRICULUM VITAE

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## Nupur Gupta

Assistant Professor

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PDPU

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## Teaching Experience:

- Teaching Assistant for B.Tech Courses: Department of Mathematics, Indian Institute of Technology Bombay, July 2005-Present,
  - Ordinary Differential Equations;
  - Numerical Analysis;
  - Finite Element Methods;
  - Multivariate Calculus;
  - Linear Algebra.

## Educational Qualifications:

- **Doctor of Philosophy (Ph.D.) Mathematics**
  - **Thesis Title:** Finite Element Methods for an Optimal Control Problem of Laser Surface Hardening of Steel.
  - **Thesis Advisor:** Professor Neela Nataraj.
  - **Institute:** Indian Institute of Technology Bombay, India.
  - **Description of Ph.D. Work:** Finite element methods including continuous Galerkin, discontinuous Galerkin and adaptive finite element methods for laser surface hardening of steel problem, which is an optimal control problem governed by dynamical system consisting of an ordinary differential equation and a non-linear parabolic equation, has been developed. In the thesis, analysis for the error estimators for all these finite element method has been done and numerical experiments are presented to support the theoretical results. All the numerical implementation has been done in C++.
  - **CPI:** 8.91
  - **Courses Credited (Pre PhD Course):** Analysis, Functional Analysis, Partial Differential Equations, Topics in Numerical Analysis, Optimal Control Theory, Finite Element Methods and Mathematical Methods.
- **Master of Science (M.Sc.) Mathematics, June 2004.**
  - **Courses Credited:** Basic Course in C++, Data Structures, Statistical Inference, Introduction to Probability, Introduction to Ordinary Differential Equations, Calculus of Variations, Fuzzy Logic, Advanced Operational Research, System Programming, Linear Algebra, Real Analysis-I, Numerical Analysis, Complex Analysis, Topology, Partial Differential Equations, Algebra.

- **CPI:** 8.3.
- **M.Sc. Project:** Parameter Estimation in Ecological Modeling using Adjoint Techniques.
- **Bachelor of Arts (B.A.)Hons.(Maths), July 2002**
  - **University:** Hansraj College, Delhi University, Delhi, India.
  - **Percentage:** 89%.
  - **Major Subject:** Mathematics.

#### **Workshops/Conferences Participations:**

- Invited to Humboldt university, Berlin, Germany, to give a talk in February, 2009.
- Presented the paper “ *On an optimal control problem of laser surface hardening of steel in “International Conference on Recent Trends in Computational PDE”*”, IIT-Bombay, December, 2008.
- “*Indo-German Workshop on Automatic Differentiation, Optimal Control Theory and Adaptivity with Applications*”, IIT-Bombay, November 2006.
- “*Summer School*” in Humboldt University, Berlin, Germany, July 2006.
- Workshop in IISC, Bangalore: “*2<sup>nd</sup> Workshop on Numerical Partial Differential Equations and Scientific Computations*”, July 2005.
- Workshop in IIT-Bombay: “*Instructional School on Computational Partial Differential Equations*”, May 2005.

#### **Publication**

- Nupur Gupta, Neela Nataraj and A.K.Pani, *On an optimal control problem of laser surface hardening of steel*, International Journal of Numerical Analysis and Modeling, Accepted.

#### **Papers Submitted**

- Nupur Gupta, Neela Nataraj and A.K.Pani, *A priori error estimates for an optimal control problem of laser surface hardening of steel*, Numerical Methods for PDE, Revised version submitted.
- Nupur Gupta and Neela Nataraj, *hp-discontinuous galerkin finite element method for laser surface hardening of steel problem*.

#### **Project during Ph.D.:**

- **Title:** Finite element method approximation of an optimal control problem governed by parabolic equation.
- **Collaborator:** Prof. Andreas Griewank, Humboldt University, Berlin.
- **Time Period:** 1 Year (2005 - 2006).
- **Software:** Checkpoint(C++), Deal II(C++).

### Software Exposure:

- **Computing platforms:** Linux, Windows 2000.
- **Programming languages:** C, HTML, C++, Matlab, Mathematica and Fortran.
- **Text formatting and office computing:** LaTeX, Microsoft Word and Power point.

### Awards/Fellowships:

- Gold Medalist in Delhi University, April 2002.
- Awarded Amar Chand Memorial Scholarship of IIT-Delhi during M.Sc, April 2003.
- Awarded Prem Kr. Memorial Scholarship of IIT-Delhi during M.Sc, January 2004.
- Secured 3<sup>rd</sup> rank in M.Sc(Mathematics), July 2004.
- Junior Research Fellowship from Ministry of Human Resources Development (MHRD), Govt. of India, for Ph.D. at Indian Institute of Technology Bombay, July 2004 - July 2009.
- National Eligibility Test for Lectureship (NET), Jointly Conducted by Council of Scientific & Industrial Research and University Grant Commission, India, December 2003.
- Secured all India rank 40 in GATE with 97.3 percentile.

### REFERENCES:

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