

Purushottam Dixit
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Objective Graduate Doctoral Program, Fall 2007

Research Interests Statistical mechanics of bio-molecules, systems biology

Education Graduate student, Chemical Engineering
University of Maryland at Baltimore County

Batchelor of Technology in chemical Engineering,
Indian institute of Technology, Bombay (GPA 8.68/10)

Research Experience **Summer Internship, International School for Advanced Studies (Trieste, Italy)**
Guide : Prof. Christian Micheletti

This project involved developing an effective mathematical model for predicting vibrations of proteins with metal ions. The data from the model was compared with all atom MD simulations.

Summer Internship, MPI for Colloids and interfaces (Potsdam, Germany)
Guide: Dr. Thomas Weikl

This project involved generalization of the simple parameters used for quantifying the folding rates of two state proteins to include disulphide bonded proteins.

Senior Thesis, Indian institute of Technology (Mumbai, India)
Guide: Dr. K. V. Venkatesh, Dr. S. Bhartiya

This project involved characterising various feedback structures in Bacteriophage lambda for robustness. We achieved establishing an importance hierarchy in the feedback structure.

Course Project, Indian Institute of Technology (Mumbai, India)
Guide: Dr. S. B. Noronha

This project consisted of a literature survey of simple models of protein folding and constructing efficient folding models to predict native state topology and folding rates.

Junior Thesis, Indian Institute of Technology (Mumbai, India)
Guide: Dr. K. V. Venkatesh

This literature survey involved systems biology modelling of genetic expression networks in stochastic and deterministic paradigms.

Summer Internship, Unilever research India (URI)
Guide: Dr. J. Dharmadhikari

This internship involved experimental and modelling studies on elongation and rupture of water droplets in fatty acid/surfactant environment under electric fields

Teaching Experience Teaching assistance for ENCH 445 (Separation processes) with Dr. Douglas Frey at UMBC

Publications P. D. Dixit, T. R. Weikl, A simple measure of native-state topology and chain connectivity predicts the folding rates of two-state proteins with and without crosslinks. Proteins 64(1) 193-7

Relevant Courses

- Introduction to molecular biology, introduction to biochemical engineering, Bioinformatics, Thermodynamics I and II, Stochastic Processes, Comprehensive biochemistry, Advanced solution thermodynamics
- Real analysis, Vector analysis and linear algebra, Differential equations, Partial differential equations, numerical methods, number theory
- Chemical kinetics (I and II), Mass transfer (I and II), Heat transfer, Instrumentation and Process Control, Fluid and Fluid-Solid operations, Advanced Kinetics
- Physical and quantum chemistry, analytical chemistry (Spectroscopic methods), Organic and inorganic chemistry, Mechanics and relativity, Electromagnetism
- Materials and Technology, Electrical engineering I, Electronics I
- Process equipment design, Transport phenomena, Chemical process design, Chemical processes (I and II), Advanced Transport phenomena

Academic Honours

- IIT Joint Entrance Exam, 2002: Ranked in the top 0.5% in the country, amongst 150,000 students who took the exam.
- National Talent Search Scholarship Recipient, 2000: Was awarded the prestigious National Talent Search Scholarship in year 2000 by the Govt. of India
- Regional Mathematics Olympiad 2001: Ranked 6th in the 2 states of Maharashtra and Goa.
- Indian National Chemistry Olympiad 2002: Ranked in top 0.5% in the Indian national chemistry Olympiad.
- Indian National Physics Olympiad: Was in the state top 1% and the center topper in physics Olympiad 2003

System Skills

- Prog. Languages : C/C++, FORTRAN, Basic
- Computational Tools : Mathematica, Matlab, Scilab, VMD

Other

- Manager and core group member. Chemsplash 2005, at Techfest, the annual technology festival of IIT Bombay
- Learned to play acoustic/electric/bass guitar, flute and piano by myself, currently playing for a music band 'Why not'. We participate in various intra/inter University events. Recently composed music video for IIT Bombay.

Reference:

- Dr. Thomas Weikl (Weikl@mpikg.mpg.de)
- Dr. K. V. Venkatesh (venks@che.iitb.ac.in)
- Dr. Cristian Micheletti (michelet@sissa.it)
- Dr. S. B. Noronha (Noronha@che.iitb.ac.in)