

**Parag Suhas Bobade**  
(Research Assistant, KDOM Lab, IIT Bombay)

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403601

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**Areas of Interest**

Dynamics and Controls, Nonlinear Dynamics, Robotics, Kinematics of Mechanisms

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**Education**

**M.Tech** in *Mechanical Engineering*, Indian Institute of Technology, Bombay [2011- Now]

Master Thesis Advisor: [Prof. Abhishek Gupta](#)

**B.Tech (Hons.)** in *Mechanical Engineering*, National Institute of Technology, Jamshedpur [07-11]

B.Tech Project Advisor: Prof. Manikant Paswan

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**Experience**

- **Research Assistant**, *Kinematics and Dynamics Lab*, IIT Bombay [Since 2011]
  - Designed and developed new experimental setups to illustrate practical applications of key theoretical concepts to undergraduate students
  - Led the team of 4 teaching assistants and planned the activities to shape the lab course
  - Responsible for lab maintenance and administrative work
- **Intern**, *ISRO Inertial Systems Unit (IISU)*, Thiruvananthapuram [Jun-Jul 2010]
  - Worked on project titled '**Design of Inertial Referencing Unit (IRU) for satellites**'
  - Designed the IRU to withstand the vibration and thermal load during the launch phase
- **Summer Intern**, *BITS Pilani, Goa Campus* [Guide: Prof. Pravin Singru] [May 2009]
  - Project Title '**Finite Element Analysis of Arm of Pulley in Belt Drive System**'
  - Analyzed load variation for torque transmission from rim to shaft through arms of pulley
  - Optimized the design and achieved cost reduction through new factor of safety

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**Scholastic Achievements**

- Ranked among the **top 0.5 %** of candidates in the country that appeared for Graduate Aptitude Test in Engineering ([GATE](#)) in Mechanical Engineering [2011]
- Bagged **1<sup>st</sup> place** for presenting review paper on "*Hybrid Electric Vehicles*" at National level Technical Symposium organized by SAE, NIT Rourkela Chapter [2008]
- Awarded **Merit Certificate** under National Scholarship Scheme in recognition of high position secured at SSCE examination [2004]
- Secured **1<sup>st</sup> Rank** in *State Level Jawaharlal Nehru Science Exhibition* for exhibiting the project titled "*Low cost Solar Water Heater*" [2002]
- Received **Certificate of Excellence** in *All India Children's Excellence Search Examination* organized by Children's Education & Excellence Promotion Trust of India [2002]

## Key Academic Projects

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**Dynamics and Control of Under-actuated Hopping robots** [Masters' Thesis] [May'13–Present]  
Guide: Prof. Abhishek Gupta

- *Goal:* Design and develop under-actuated hopping robot with rotating mass as actuator
- Developed mathematical model to understand the system dynamics
- Identified the various parameters and investigated their effect on the hopping ability
- Propose control strategies and implement them in the prototypes

**Ankle Fixator for Arthritis** [Course: Collaborative Engineering] [Jan–April 2013]  
Guide: Prof. B.Ravi, [OrthoCad Lab](#)

- Designed device to treat ankle arthritis for wider demography of patients
- Evaluated and compared the existing methods for treatment to identify essential problems associated with them
- Our solution was reviewed and appreciated by orthopedic surgeons and biomedical experts for bold approach

**Study and Design of Semi-Active suspension systems** [B.Tech'Project] [2010-2011]  
Guide Prof. Manikant Paswan

- Studied and compared the various existing control strategies implemented in Semi-Active suspension systems
- Virtually tested and implemented the controls using SIMULINK on the quarter car model

## Seminars/Talks

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**Reconfigurable Robotics** [*M.Tech Seminar* | Advisor: Prof. Anirban Guha] [Aug-Nov 2012]

- Critically reviewed the need for reconfiguration in robots and classified them
- Analyzed and compared various reconfigurable robotic vehicles for their pros and cons

**Duffing Oscillators** [Course: *Nonlinear Dynamics* | Course Instructor: Prof.P.Paramanand] [Oct '12]

- Elucidated the nonlinear phenomena like jump, chaos and strange attractors for the model
- Reviewed the ramifications in the behavior of model for real world applications

**Electromagnetic Weft Insertion Technology** [Course: *Textile Machinery Design and Automation*]  
Course Instructor: Prof. Anirban Guha [Feb-March 2012]

- Surveyed current state of art technology for weft insertion in Textile Machineries
- Analyzed and discussed effect of various parameters on weft insertion in process

**Passive Dynamic Walking** [Course: *Nonlinear Systems Analysis and Control*]  
Course Instructor: Prof. Abhishek Gupta and Prof. V. Karthik [Mar-Apr 2013]

- Reviewed the existing literature and studied various simplified models of walking
- Presented brief overview of the research and challenges posed in this field

## Position of Responsibilities

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Post Graduate Nominee, [\*Students' Technical Activities Body\*](#), IIT Bombay

- Spearheaded **six clubs** under STAB along with Overall Coordinator and increased the outreach of club activities among PG community at the institute
- Ideated novel event '**ROFL-Research Only for Laughs**' – Aimed to explicate research to laymen, and do it with a tinge of humor; the initiative was widely appreciated among PG's & faculties

Chair Person, Society of Automotive Engineers, NIT Jamshedpur Chapter

- Led a team of **six** people to represent **250+** club members
- Started newsletter "**Celerity**" to inculcate interest; disseminate knowledge among UG's
- Contrived numerous club activities like quizzes, guest lectures and workshops to invigorate interest among students in field of automotive engineering

Member, [\*Association of Friends of Astronomy\*](#), Margao Chapter

- Involved in **publicizing astronomy** in the town and **enthuse** the school kids, through various activities at **Public Astronomical Observatory**, Margao-Goa
- Conducting weekly sky observation sessions and workshops to handle telescopes

## Extracurriculars

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### Star Gazing

- Secured **1<sup>st</sup> place** in the **Inter-IIT Messier Marathon 2012**, held at [GMRT](#) Pune
- Experienced in handling Newtonian Reflector Telescope (mostly Equatorial, Azimuthal or Dobsonian Mount)

### Avid Quizzer

- **Winner** Lit-Quiz organised during *PG-Cult '13*, IIT Bombay.
- **2<sup>nd</sup>** in *Auto-Quiz* and *Biz-Quiz* at *OJASS '10*, NIT Jamshedpur ( National Level )
- **Second** place at General Quiz, *Literary & Debating Society* NIT Jamshedpur
- **Runners-up**, at *House of Kare Rolling Trophy*, Goa (State Level)
- **Quizmaster**, Conducted numerous exciting & entertaining quizzes at NIT Jamshedpur

### Sports Enthusiast

- **Silver Medal** at '*Institute Basketball League*', IIT Bombay
- **Bronze Medal** in *Table Tennis* in PG Sports (2011) at IIT Bombay

### Other

- **Execution Panelist**, *InsighT*, Media Body of IIT Bombay; Carried the background research for the team by gathering data, facts & numbers for the articles
- Completed six weekend certified training course on '**Intellectual Property Rights Fundamentals**', organized by **SJM School of Management**, IIT Bombay
- Elementary Level Proficiency in **Spanish**
- Play **Acoustic Guitar** and **Tabla**