Résumé

Personal Information

Name	Subhrajit Bhattacharya
Date of Birth	August 22, 1983
Nationality	Indian

Contact Information

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Education

B.Tech., Mechanical Engineering
Indian Institute of Technology, Kharagpur
India, June 2006.

Ph.D., Mechanical Engineering (Specialization: Robotics)
Department of Mechanical Engineering and Applied Mechanics
University of Pennsylvania
Philadelphia, USA, *currently pursuing*.

Academic Performance [Arranged in reverse chronological order]

PhD (in pursuit)
University of Pennsylvania
GPA: 3.88 on a scale of 4 (till 5th semester)

B.Tech, Apr 2006
IIT, Kharagpur
GPA: 8.87 on a scale of 10 (at the time of graduation)

Courses taken at undergraduate Level (selected list)

Mechanics, Vibration and Noise Control, Engineering Drawing and Graphics, Dynamics, Dynamics of Machines, Kinematics and Kinetics of Machines, Design of Machine Elements, Machine Tools and Machining, Introduction to Manufacturing Processes, Workshop Processes, Casting, Forming and Welding, Quality Assurance and Reliability — Electrical Technology, Basic Electronics, System and Control, Robots and Computer Controlled Machines, — Programming and Data Structure, Soft-Computing Tools in Engineering, Computer Graphics and Solid Modeling, — Fluid Mechanics, Thermodynamics, Fluid Machinery, Mechanics of Materials, Heat Transfer, Applied Thermodynamics I, Applied Thermodynamics II, — Introduction to Aerospace Structures, Low Speed Aerodynamics, Dynamics of Aerospace Structures, Mechanics of Flight, — Mathematics-I, Mathematics-II, Mathematics-III [Transform Calculus], Mathematics-III [Partial Differential Equation], Chemistry, Physics, English for Communication, Communication Skills, Extra Academic Activity [NSO Swimming], Economics.

Courses taken at graduate Level (selected list)

Advanced Dynamics, Nonlinear Control Theory, Distributed Dynamic Systems, Robotics, Introduction to Artificial Intelligence, Machine Perception, Introduction to Optimization Theory, Motion Control of Multi-Robot Systems, Stochastic Models, — Foundation of Engineering Mathematics - I & II, Continuum Mechanics, Transport Processes, — **To be completed in Spring 2009:** Modern Convex Optimization.

Teaching experience - courses for which has been a Teaching Assistant

Advanced Dynamics (graduate level course) — Fall 2007
Engineering Mechanics: Dynamics (undergraduate level course) — Spring 2008
Robotics and Automation (graduate & undergraduate level course) — Fall 2008

Invited lecture

Was invited for giving a talk on the Littledog Robot and Learning Locomotion project for an undergraduate level class on robotics at the Swarthmore College, Pennsylvania.

Industrial training

Was selected for a 2-month long training at Larsen & Toubro Limited, Powai Works, Powai, Mumbai during May-July 2005. During that particular training period, various types of tasks including FEM analysis of pressure vessels, Design of components, study on Plastic analysis of components, Database management and related coding, etc. were executed. The training gave an excellent exposure to the ways in which works are executed in industries.

Publications (Journal & Conference)[Arranged in reverse chronological order]

1. Subhrajit Bhattacharya, Maxim Likhachev, Vijay Kumar, *"Decentralized Robot Motion Planning with Constraints"*, Submitted for 2009 Robotics: Science and Systems Conference (RSS). **[Status: Paper is under review]**

2. Paul Vernaza, Maxim Likhachev, Subhrajit Bhattacharya, Sachin Chitta, Aleksandr Kushleyev, Daniel D. Lee, *"Search-based planning for a legged robot over rough terrain"*, Accepted for 2009 IEEE International Conference on Robotics and Automation (ICRA). **[Status: Paper has been accepted]**

3. Subhrajit Bhattacharya, Sachin Chitta, Vijay Kumar, Daniel Lee, *"Optimization of a Planer Quadruped Dynamic Leap"*, Proceedings of 2008 ASME International Design Engineering Technical Conferences (IDETC), New York City, NY, August 2008.

4. Subhrajit Bhattacharya, *"A Study on Effect of Stiffener Geometry on the Modal Frequencies of a Rotating Disk with Radial Stiffeners using FEM and Analytical Methods"*, Proceedings of Ninth International Conference on Recent Advances in Structural Dynamics, University of Southampton on July 2006.

5. Subhrajit Bhattacharya, Siddharth Talapatra, *"Robot Motion Planning Using Neural Networks: A Modified Theory"*, International Journal of Lateral Computing, Vol.2, No.1, December 2005, ISSN 0973-208X, 9-13; Proceedings, Second World Congress on Lateral Computing, Bangalore, December 2005.

6. Subhrajit Bhattacharya, *"An Accurate Structural Approach to Pattern Recognition"*, Accepted for presentation in 8th International Conference on Enterprise Information Systems, 23-27 May 2006, Paphos-Cyprus. **[Status: Paper not published for not being able to attend the conference because of unavoidable circumstances]**

7. Subhrajit Bhattacharya, *"A study on a generalized wave equation for disturbances propagating through a one-dimensional medium placed in a two-dimensional space"*, Proceedings, International Conference on Theoretical, Applied, Computational and Experimental Mechanics 2004, p. 235-237, Indian Institute of Technology, Khatagpur.

Projects and Thesis[Arranged in reverse chronological order]

1. *"Fast SLAM using a geometric approach and some unconventional methods"*, Spring-Summer 2008. (Project for MEAM 620 - Robotics; Research topic for Summer 2008)

2. *"Automated solution of a jigsaw puzzle from a picture of the scrambled pieces and a picture of the target image"*, Fall 2007. (Project for CIS 580 - Machine Perception and Computer Vision)

3. *"On Maintenance of Connectivity of Mobile Robot Network Using a Decentralized Scheme"*, Spring 2007. (Project for ESE 680 - Distributed Systems & Networks)

4. *Phase 2 of Learning Locomotion project*, Summer 2007, Fall 2007, Spring 2008. (http://www.darpa.mil/ipto/programs/ll/ll.asp)

5. *"Motion Planning in a Stratified Workspace Manifold of a Quadruped Walking Robot"*, Spring 2007. (Qualifying exam topic and thesis)

6. *"Auto-pilot design: Design of Control system for control of flexible guided missiles"*, Spring 2006.

7. *"Study of flow induced vibrations and analysis of stability of flows over flexible surfaces"*, Spring 2006.

8. *"A study on short period dynamics and stability of flexible missiles"*, Jan-April, 2006.

9. *"Theoretical and Computational analysis of modes of vibration of a rotating annular disk with stiffeners"*, Jan-April, 2005.

10. *"A Study on film boiling using a Coupled Level Set and Volume of Fluid (CLSVOF) method for constant temperature and constant heat flux wall models for 2D and Axisymmetric cases"*, May-June, 2004. (Summer internship project at IIT Kanpur under Prof. Gautam Biswas)

11. *"A Study on Rolling (without slipping) of a Generalised Body on a Flat Plane"*, March-April, 2004.

12. *"Using CFD techniques to study and simulate the deformation of gas bubble rising in a liquid"*, December 2003.

Award/Merit for Distinction & Academic Achievements[Arranged in reverse chronological order]

1. **MSC Simulation Software Award** at the 2008 ASME International Design Engineering Technical Conferences (IDETC), New York City, NY. (August 2008)

2. Departmental Fellowship award for Graduate studies at the Department of Mechanical Engineering and Applied Mechanics, University of Pennsylvania. (Summer, 2006)

3. **Best Paper Award (students')** in Second World Congress on Lateral Computing, 2005, Bangalore. (Dec, 2005)

4. Offer of Scholarship from Jawaharlal Nehru Centre for Advanced Scientific Research for summer research project. (March, 2005)

5. Selected for interview for admission to Indian Statistical Institute. (June, 2002)

6. National Scholarship on basis of performance in Higher Secondary Examination. (April, 2002)

7. Second prize in HEADACHE (a problem solving competition) organized by Department of Mathematics, IIT Kharagpur. (Jul, 2001)

8. Second prize in IMAGES (a software modeling competition) organized by Department of Mathematics, IIT Kharagpur. (Jul, 2001)

9. National Scholarship on basis of performance in Madhyamik Examination. (Dec, 2000)

10. Award obtained on the basis of performance at the Talent Search Test conducted by A.I.M.T. (Aug, 1999)

Programming skills

MATLAB	Have worked extensively in MATLAB for more than 4 years. These include working for the Learning Locomotion project, research work & papers, and term projects.
C & C++	Have worked extensively in C and C++ programming languages in relation to various research projects. Experienced in working with C++ classes, templates, etc.
Visual Basic	Initially self-taught, created several GUI applications using this language as hobby, and used it for developing a database management tool during training at Larsen & Toubro Limited.
FORTRAN	Used FORTRAN as the programming tool during internship at IIT Kanpur during Summer of 2004.

Experience with Mathematical and Engineering softwares

Mathematica	Have worked extensively in Mathematica in relation to research and term projects.
Pleyer & Gazebo	Have worked using the open-source multi-robot simulator, Gazebo; and the robot device interfaces provider, Player.
LaTeX	Experienced with writing technical papers in LaTeX.
CFD & CAD tools	Have experience in working with Auto CAD 2002, ANSYS 8.0, FLUENT 6 and I-DEAS.

Web design and Photo editing tools

Adobe Photoshop	Have worked extensively on this photo editing software.
HTML, Javascript, PHP	Have extensively worked on web-site development and maintenance. Some of the web-sites for which has been an administrator: http://philly.aidindia.org/, http://www.aidindia.org/, Some of the course web-sites at Penn, http://iser08.grasp.upenn.edu/, http://www.ieee-case.org/
CMS experience	Experienced in setting up and administering CMS based web-sites like those working on Wiki, Drupal and Joomla.

Self-study and casual study

Topics of major Self-study: Fractal Geometry, Theory of Special Relativity
Casual study: Various topics on Physics, Mathematics, Biology, History, Sociology, etc.

Association with AID

Association for India 's Development (AID) [http://philly.aidindia.org/] is a volunteer movement committed to promoting sustainable, equitable and just development. In solidarity with non-violent people's struggles, AID supports grassroots organizations in India and initiates efforts in various interconnected spheres such as education, livelihoods, natural resources, health, women's empowerment and social justice.
Have been volunteering for AID since Spring 2007.

Terms served as an Office Bearer for the Philadelphia Chapter of AID

President	April 2008 - present
Secretary	Summer 2007 - April 2008
Webmaster	Summer 2007 - present

Coordinator for AID projects

Have served as project coordinator of the following AID projects [Visit http://philly.aidindia.org/ for more details]:

  i. VCA Legal Centre project for protecting and seeking justice for the tribals of Dantewara district of Chhattisgarh against the attrocities of Salwa Judum.

 ii. Tribal education through establishment of child growth centers.

iii. Education support for rescued girls, students - a project by Snehalaya.

Fundraisers, Campaigns, Newsletters, Web-site administration for AID

- **Fundraisers:** Have been involved in small-scale fundraisers at the chapter level as well as large-scale fundraiser like that for the Eureka Child Project (http://www.eurekachild.org/).

- **Campaigns:** Have been involved in the Free Binayak Sen campaign, Campaign against unethical practices by the Coca-Cola company, Campaign for protecting the interests of farmers in India, etc. Has also been involved in hosting talks by reputed social workers, journalists and activists from India.

- **Newsletters:** Were an editor for the September and November 2008 issues of TMIA, the monthly newsletter of AID (http://publications.aidindia.org/).

- **Web-site administration:** Have served as administrator for the following websites: http://philly.aidindia.org/, http://www.aidindia.org/, http://www.goeurekachild.org/

Sports

Martial Arts	Brown (6th) Kyu in Zen Shitoryu Karate approved by AIKF (All India Karate-Do Federation).
Swimming	Were in National Sports Organisation, India (swimming) for two consecutive years.

<u>Music</u>

  Singing & Sitar   Learnt sitar (an Indian classical musical instrument) for more than 10 years under the guidance of professional players. Have made stage performance two times.

  Harmonica & Classical Guitar   Self-taught the instruments.

<u>Arts</u>

  Drawing & painting   Final year in diploma in Fine Arts (All India Fine Arts Association).

  Dramatics   Played major roles in several dramas organized by BTDS (Bengali Technology Dramatics Society) at IIT Kharagpur.