Chahat Deep Singh

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Objective **A Position in the field of Robotics and Control**, *with special interests in Applied Robotics, Walking Algorithms, Computer Vision and Motion Planning*.

Key Highlights

- ***Winner*** of the **NSS** (*National Student Symposium*), **IEEE** Technical Event, New Delhi, 2014
- **Semi finalist** in **All India *Texas Instrument's Innovative Challenge*** (TIIC) 2015 among ten thousand students across the nation.
- Currently working on **Gait analysis using Inductive System** at the *Indian Institute of Technology- Delhi*
- Project Intern at *Defence Research & Development Organization* (DRDO) (Summer 2014)
- Worked with *Squadron Leader R Vasant* to develop an **Altimeter** for *Indian Air Force*
- Independently working on ***Drift-free Altitude measurement*** *of UAVs using MEMS IMU & Barometer*
- ***Winner*** of **Homi Bhaba National Innovation Challenge** by ISTE, New Delhi, 2014
- **Lead 3D Software Designer** throughout the undergraduate period.
- Serving as a **volunteer** at ***Art of Living Foundation since 2008***
- Taught **Applied Robotics** to my fellow juniors as a member of **RobotiX United** for a period of 4 months at Bharati Vidyapeeth's College of Engineering
- **IEEE Member**- Delhi Section (2013-2014)

Publications

- Shamsheer Verma, **Chahat Deep Singh**, Sarthak Mittal, Prateek Arora, *A Static Rotational-Equilibrium Camera Design inside a Mobile Spheroid Robot*, ***Springer International Journal of Social Robotics***, ISSN: 1875-4805, under review, 2015.
- **Chahat Deep Singh**, Pranshu Jhamb, Dr. Arvind Rehalia, *A Technique for Musical fImprovisation using Hand Gesture Recognition*, ***Elsevier Journal of Applied Research & Technology*** *(JART)*, ISSN: 1665-6423, under review, 2015.
- **Chahat Deep Singh**, B. Sridhar, 2015, *A Novel Method to Increase Transmission Power Efficiency in Portable Systems*, ***International Journal of Innovative Research in Science Engineering and Technology*** *(IJIRSET)*, ISSN: 2319-8753, Vol. 4, Issue 11.
- Shamsheer Verma, **Chahat Deep Singh**, Dr. Arvind Rehalia, *Autonomously Controlled Quadruped using Face Detection and Tracking Algorithms*, ***International Journal of Engineering and Technical Research***, ISSN: 2321-0869, Volume-2, Issue-9, Sep 2014.

Education

2011–2015 **B.Tech in Electronics and Communication Engineering**,
Bharati Vidyapeeth's College of Engineering (CPI 66.1%|WES: 3.65), GGSIPU, New Delhi, India.

2010 **Class XII**,
New Delhi Public School, Vikas Puri, New Delhi, India.

2008 **Class X**,
S.S.Mota Singh Sr. Sec. Model School, New Delhi, India.

Projects and Research Experience

Title ***Drift-free Altitude measurement* of UAVs using IMU & Barometer** *Fall 2015-Present*

Description To develop a quadcopter/UAV and study the drift-free vertical positoning by fusing MEMS IMU and barometer. Currently working on the human walking tracking and estimation of the step-size and speed using MATLAB.

Title ***Gait analysis using Inductive System* for human body fall prediction** *Fall 2015-Present*

Advisor Dr. Sudipto Mukherjee, Indian Institute of Technology -Delhi

Description To study inductosyn sensors and encoders and design a human fabric for human body joints in order to predict the human fall.

Title ***Autonomously controlled quadruped using face detection and tracking***

Advisor Dr. Arvind Rehalia

Description To study creep and trot *GAIT* algorithm and develop a quadruped robot with Face and Object Detection Capabilities based on KLT Algorithms using *OpenCV*. The idea is to perform innovative functions with the robot wirelessly via tracking the human face.

Title ***Laser Wander Corrections using detection algorithms* (OpenCV)** *Summer 2013*

Supervisor Vijyant Bhardwaj, Scientist, *LASTEC Lab, Defence Research and Defense Organization* (DRDO)

Description To study the Adaptive optical system, focus the spot of the high power laser beam and increasing the power density on the target.

Title ***Mobile Surveillance Spheroid with Auto-Stabilised Camera and Leaping Mechanism***

Description for Texas Instruments Innovative Challenge 2015; Implemented a spheroid robot with an auto stabilized camera with static rotational equilibrium and a leaping mechanism used specifically for high speed surveillance.

Title ***AK350 based Flight Altitude Mensuration*** *Summer 2012*

With Squadron Leader R Vasanth, Indian Air Force

Description To develop a prototype demonstrator of a calibration tester for encoding *Gillham* code to the altitude for to be used in aviation.

Title ***A Novel Method to Increase Transmission Power Efficiency in Portable Systems***

Description To develop a wireless system in order to minimize the transmission power of high band radio signals (using *HFSS Simulation Software* and Atmel 32U4/328p).

Title ***AT Commands Set based Assistive Smart Watch*** *Major Project*

Advisor Asst. Prof Shifaly Sharma

Defiption Developed a compact wearable smart system capable of performing emergency calls on abrupt changes in human pulse, temperature etc. This device targets the visually impaired humans.

Title ***Hand Gesture Recognition for Musical Improvisation*** *Minor Project*

Advisor Asst. Prof Shifaly Sharma

Description Developed a compact system that consists of a pair of wearable gloves (transmitters) and a receiver for playing various musical instrument using hand gestures improvisation.

Title ***Quill: Hand Gesture Computer Peripheral*** *U.G. Semester 6*

Description Developed a glove with innovative gesture for keyboard and mouse capabilities. Used an *IMU*(using complimentary filters) and flex sensors for the gesture control.

Title ***Mouse and hand gestured controlled Webcam rotation*** *U.G. Semester 5*

Description Controlled the motion of a computer webcam using hand gestures and mouse cursor using Atmel 328p and Atmel 2560ADK Microcontroller were used in order to process the data.

Title ***Line, light follower and obstacle avoiding robots*** *U.G. Semester 2 and 3*

Description Developed a basic autonomous robot to control the locomotion using infrared LDRs and LEDs.

Independent Coursework *(MOOCs)*

Visual Perception and the Brain (80.7%),
Duke University.

Calculus One (88.2%),
Ohio State University.

Introduction to Engineering Mechanics (73.3%),
Georgia Institute of Technology.

Computer Skills

- 3D Designing using *Autodesk Inventor*
- *Arduino* and *Atmel 328p/2560/32U4* Microcontroller Programming
- *Raspberry Pi* and *Beagleboard* I/O Programming
- C, C++
- MATLAB and Simulink
- Ansoft *HFSS* and *Maxwell*
- Bash, LaTeX and HTML
- Assembly Language (for the Intel *8051* microprocessor and *8086* microprocessor)
- Robot Operating System
- *OpenCV*

Professional Experience

- Serving as a **volunteer** at **Art of Living** Foundation *2008-Present*
- Served as **Creative Head** for the NGO - **Plants Guardian Society** *2012–2013*
- Project-Intern at BVCOE in *Embedded Systems* *May–June 2012*
- Event manager of Differential Drive, Line and Light following *IEEE* Robotic Competition, New Delhi *October 2012*
- Seminar Presentation on *'Assistive Technologies'*, *BVCOE*, New Delhi *Nov 2014*

Extra Curricular Activities

- Regular Yoga and *Sudarshan Kriya* Meditation practices taught at the Art of Living foundation
- An Avid Reader of Fiction and Detective Stories
- Chess and Solving puzzles such as Rubik's Cube and Suduko