

## **Objective:**

Full time job starting from June 2010 related to my skills in Electrical, Hardware and Mechanical Engineering, Robotics and Embedded Control Systems.

## **Skills:**

- Embedded Controllers - Atmel AVR, Microchip PIC.
- Well versed with Protocols like RS232, RS422, RS485, SPI, I2C, USB, PWM, etc.
- Worked extensively on multi-layer PCB Designing using Altium Designer (previously known as Protel)
- Digital Design using VHDL, Altera Quartus, CPLDs, FPGAs.
- Analog Design, Sensor and Signal Processing
- Design and Hardware implementation using Analog, Digital and Power Electronics
- Circuit Analysis and Active Filter Design using NI Multisim and TINA-TI.
- Programming using C, C++, MATLAB, LISP, PROLOG
- CAD using AutoCAD, Solidworks, Geometry of Robots and Attitude Estimation.
- Database – Oracle, DB2 using SQL, MS Access. MS-OFFICE, etc.
- Selection and integration of COTS electrical products to custom design Electrical Components.

## **Education:**

- Master of Science (Non -Thesis) Jan 08 – May 2010 GPA : 3.5 / 4.0  
**Mechanical Engineering (Dynamics and Controls)**  
University of Florida, Gainesville, Florida, US
- Master of Science (Thesis) Jan 08 – Dec 2009 GPA : 3.6 / 4.0  
**Electrical & Computer Engineering**  
University of Florida, Gainesville, Florida, US
- Bachelor of Technology Aug 2001 – May 2005 %age : 75 / 100  
**Electrical Engineering**  
National Institute of Technology, Rourkela, India (Among Top 10 Engineering Institutions in India)  
Awarded Institute Gold Medal for Best B.Tech Project (1<sup>st</sup> among 400 engineering students)

## **Graduate Courses:**

- Intelligent Machine Design Lab
- Academic Spoken English
- Geometry of Robots I & II
- Machine Intelligence I & II
- Digital Signal Processing
- Analytical Dynamics
- State Variables & Control
- Architecture of Autonomous Ground Vehicles
- Control System Theory
- Independent Research
- Digital Design

## **Under Graduate Courses:**

- Physics I & II
- Fluid Mechanics
- Microprocessors
- Digital Logic
- Electronics I & II
- Mathematics – I, II, III & IV
- Engineering Mechanics
- Power Systems I, II, III & IV
- Energy Conversion I & II
- Digital signal Processing
- Basic Electrical Engg
- Engineering Drawing
- Electromagnetic fields
- Circuits I & II
- Communication
- Thermodynamics
- C Programming
- Instrumentation
- Power Electronics
- Linear Controls

## **Research / Work Experience:**

- **(May 10 – present) Sensory Processes Lab, Psychology dept, University of Florida**  
(Role: Research Engineer) (Guidance of Dr. Keith D White)  
Currently, I am making the Electrical System for a Vestibulator (like a big turn table) which will be used to do experiments on Autistic children and study the response of their Vestibular System (Inner Ear). The Electrical System includes making a Brushless DC motor controller, making PCBs and writing low level C code for the embedded system and writing VHDL for the Digital Hardware.
- **(Aug 09– present) Subjugator, the Autonomous Submarine for AUVSI Underwater Vehicle Competition 2010** (Role: Electrical Team Leader)  
Machine Intelligence Lab, University of Florida (Guidance of Dr. Eric Schwartz)  
I am responsible for all the Electrical systems on the Submarine – namely Motor Drivers, Interfacing boards, hydrophone data Acquisition, Battery Monitoring, Power Management, Integration of various sensors like IMU, Compass, Doppler Velocity Log, Depth Sensor for Attitude and State estimation, 6 DOF quaternion based Linear Control System and Training new EE team members for the future team.
- **(Aug 09 – present) Human Powered Submarine for International Submarine Race 2010**  
(Role: Electrical Team Leader)  
I am the only Electrical Team Member and responsible for all the Electrical systems on the HPS which includes Integration of various sensors like Depth Sensor, IMU, Paddle Wheel Velocity sensor, Underwater Switches, Automatic Pitch Control, Drive by Wire Yaw Control, Automatic Propeller Pitch Control, Data Logging, Battery Monitoring, Power Conditioning and Underwater Connectors.
- **(Jan 10 – May 10) Digital Logic Lab, ECE dept, University of Florida** (Role : Teaching Assistant)  
I managed three sections of Lab with 14 students in each section.
- **(Jan 09 – July 09) Subjugator, the Autonomous Submarine for AUVSI Underwater Vehicle Competition 2009** (Role: Team Member)  
Machine Intelligence Lab, University of Florida (Guidance of Dr. Eric Schwartz)  
Responsible for designing Depth sensor, Battery Monitor, Magnetic Power Switch, Motor Drivers and supporting other Electrical systems on the Submarine.
- **(Jan 09 – June 09) Human Powered Submarine for International Submarine Race 2009**  
(Role: Team Member)  
I was the only Electrical Engineer on the Team. I designed and fabricated the complete drive-by-wire electrical system for Pitch and Yaw Control using Microcontrollers. The team won 2<sup>nd</sup> prize for Innovation and finished as the 5<sup>th</sup> fastest single-person propeller-driven Human Powered Submarine.
- **(Aug 09 – Dec 09) Power Lab, ECE dept, University of Florida** (Role : Teaching Assistant)  
Managed two sections of Lab with 12 students in each section. Added new experiment and re-wrote most of the Lab Manual.
- **(Aug 09 – Dec 09) Junior/ Senior Design, ECE dept, University of Florida** (Role : Teaching Assistant)  
Managed Lab for one section of Junior Design and one section of Senior Design. Fabricated PCBs for designs submitted by students.
- **(May 09 – Dec 09) Centre for Intelligent Machines and Robotics, University of Florida**  
(Role: Masters Thesis Student) (Guidance of Dr. Carl Crane)  
Design and implementation of a 6 DOF passive parallel manipulator which is mounted on the distal end of a 6 DOF Industrial Serial Manipulator to ensure simultaneous force and torque control. It had numerous constraints and the hardware needed to be small, compact, battery powered and equipped with wireless sensor interface.

- **(May 09 – July 09) Senior Design Lab, ECE dept, University of Florida (Role : Teaching Assistant)**  
Managed two sections of Lab for a class of 17 students. Fabricated PCBs for designs submitted by students.
- **(Jan 09 – May 09) Power Lab, ECE dept, University of Florida (Role : Teaching Assistant)**  
Managed two sections of Lab with 8 students in each section. Reviewed/edited the Lab Manual.
- **(Aug 08 – May 09) IEEE Robot Hardware Competition for South East Con 2009 (Role : Co-leader )**  
Machine intelligence Lab, University of Florida (Guidance of Dr. Eric Schwartz)  
Built an Autonomous Trash Collecting Robot and published the paper "*TailGator: Design and Development of Autonomous Trash collecting Robot*" in the 22nd Florida Conference on Recent Advances in Robotics (FCRAR), May 21-22, 2009
- **(Jan 08 – May 08) Intelligent Machine Design Lab, ECE dept, University of Florida**  
Designed a Two wheeled Self Balancing Robot (Guidance of Dr. Eric Schwartz and Dr Antonio Arroyo)  
Also awarded "Most Valuable Person of Lab" for helping numerous other students in making their robots
- **(Jun 06 – Dec 07)Automotive Centre of Excellence, Satyam Computer Services Ltd, Chennai, India**  
Role: Project Coordinator and Leader – An Intelligent Autonomous Mobile Robot to be a platform for Automotive Research & Tour guide of the R&D Lab. I designed the project requirements, coordinated with Dr ROBOT Inc, Canada for the design and fabrication of customized robot hardware, installed it and guided the programming team for its customization.  
Being one of the first few members of the Centre of Excellence, I shared the innovative idea of installing a Robot to foster automotive research and boost branding, did process & resource management directly under the VP, also helped the Pre-sales & Marketing Unit in showcasing the R&D lab to leading Automotive and Manufacturing clients from various countries.
- **(Jul 05 – Jun 06) Caterpillar Offshore Development Center, Satyam Computer Services Ltd, Chennai, India**  
Role: Programmer Analyst working with COBOL for Caterpillar HR Management systems running on Mainframe Computers.
- **(Dec 05 – Jun 06) Equitech, AID-INDIA – International Non-Profit Corp., Chennai, India**  
Developed inexpensive educational Robots and basic scientific models/kits with a vision to excite and develop eagerness among the unprivileged youth in India towards science and technology.
- **(Jun 04 – May 05) Under Graduate B.Tech Project at EE Dept, National Institute of Technology, Rourkela, India**  
Autonomous high speed Line following Robot capable of maneuvering sharp turns & intelligent response to breaches in line.  
This project led to Best B.Tech Project Institute Gold Medal among 400 students in 2005 batch, won 3<sup>rd</sup> fastest line following robot at National level technical symposium, Indian Institute of Technology, Kanpur, India & led to the following publications:
  - "Mobile Robots: Evolution" in CONFLUENCE 04, a National Level Students' Technical Symposium, NIT, Rourkela
  - "Mobile Robots: Evolution from a manually operated vehicle to autonomous robot" in the 46th Technical Annual (2005), Institute of Engineers (India), Orissa state centre.
- **(Jun 03 – Apr 04) Innovative Student project - Musical Fountain at National Institute of Technology, Rourkela, India**  
Role: Project Leader – As a sophomore, I developed a working miniature model of a musical fountain, demonstrated it as a proposal and then finally, coordinated and worked on its large scale implementation in the Institute garden.

- **(May 04 – Jun 04) Summer Internship** - Upper Kolab Hydro electric Power Project, OHPC Ltd, Orissa, India.
- **(May 03 – Jun 03) Summer Internship** - Plate Mill, Rourkela Steel Plant, Steel Authority of India Ltd. (SAIL), India

### **Extra-Curricular Activities & Achievements:**

- **(2008-09)** Student member of Institute of Electrical and Electronics Engineers (IEEE)
- **(2009)** Student member of Association for Unmanned Vehicle System International (AUVSI)
- **(2008)** University of Florida Achievement Award for New Engineering Graduate Students.
- **(2005)** Pat-On-Back Award and a letter of appreciation for outstanding efforts in Satyam Computer Services Ltd.
- **(2004-05)** Student Technical Secretary, the Science and Technical Society, NIT, Rourkela.
- **(2004)** Overall Coordinator, CONFLUENCE 2004 (The National Level Students' Technical Symposium) NIT, Rourkela.
- **(2005)** Illrd prize – National Level Autonomous line follower Robotics contest, Indian Institute of Technology (IIT), Kanpur
- **(2005)** Certificate of Appreciation in Survivor: International Robotics Challenge in TECHFEST '05 – IIT Bombay.
- **(2004)** IInd prize – National Level Remote controlled Robotic race – Indian Institute of Technology (IIT), Roorkee
- **(2004)** IInd prize – National Level Remote controlled Robotic race – Indian Institute of Technology (IIT), Madras
- **(2004)** Ist prize in S-M-BLEX: Electronics Circuit Design Contest – National Institute of Technology (NIT), Rourkela
- **(2001)** In Top 1% of 24589 candidates - National Standard Examination in Physics - Indian Association of Physics Teachers.
- **(1998)** Merit Scholarship awarded by Steel Authority of India Ltd. for exceptional academic performance in the Xth grade.

### **Visa Details:**

- Nationality : INDIAN
- Current US VISA : F1

***Subrat Nayak***