

# SAGNIK BASU

## PERSONAL DATA

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DATE OF BIRTH: 20 March 1995  
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## EDUCATION

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2013-2017 B.Tech. (8th semester), ELECTRONICS AND COMMUNICATION ENGINEERING, ,  
**National Institute of Technology Rourkela**  
THESIS: Design of Intelligent Wearable Device based on Cognitive Radio and IoT  
CGPA: 8.00/10.0

## WORK EXPERIENCE

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<i>June 2019- Current</i>	<b>Senior Engineer at <a href="#">Samsung Research Institute-Bangalore</a></b> <i>Area :- Computer Vision for ADAS systems</i> Develop computer vision, linear algebra, and neural network kernels for Samsung Exynos Visual Api (SEVA) for <a href="#">Automotive</a> chipsets. Implement Structure from Motion pipelines like Optical Flow (Lucas-Kanade and Warping based), Block Singular Value Decomposition. Study and Develop fixed point quantized Neural Network-based solutions for Optical Flow on DSP architectures. Key Performance Indicator is to match the performance of the top 5 in the KITTI dataset. Study Samsung's proprietary Neural Processing Unit and understand concepts related to Featuremap Lossless Compression (FLC).
<i>Sep 2017- June 2019</i>	<b>Software Developer at <a href="#">Visteon</a></b> <i>Area :- ADAS Middleware / Autonomous Driving</i> Part of the team to develop Computer Vision Software Stack on <a href="#">Drivecore</a> platform (with Linux/QNX support) for Autonomous Driving. Develop <a href="#">algorithm nodes</a> in C++ with input from CV/AI team for lidar-based lane detection in highway roads. Optimize the algorithm using fixed-point quantization and tuning of hyper-parameters. Develop a QT and python based tool for visualization and validation of automotive sensor data.
<i>May-July 2016</i>	<b><a href="#">Research Intern</a> at SPACE APPLICATIONS CENTRE, ISRO, AHMEDABAD,</b> <i>Area :- On-board Digital Signal Processing Systems</i> RTL design of channel estimation algorithm for DVB-RCS satellite protocol. Testing was done in Xilinx Virtex 5, USRP B210 and Zynq based FPGA development kits
<i>May-June 2015</i>	<b><a href="#">Research Intern</a> at IIT ROORKEE,</b> <i>Area :- Image processing and Machine Learning</i> Study of fundamentals of image processing and Machine Learning. Implemented an algorithm on fuzzy classification of Breast Cancer Data-set, in Matlab

## RESEARCH PROJECTS

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| <i>September 2017-April 2017</i> | <b>Intelligent Wear-ables Based on IoT and Cognitive Radio Technology</b><br><i>Department of Electronics and Communication, NIT Rourkela</i><br>A proof-of-Concept wearable system based on IEEE 802.11-af (TV White Space) specifications. Worked on ARM8(Raspberry Pi 3) and ARM11 (MediaTek Linkit One) processors and NI USRP B210(Software Defined Radio) for real-time applications. Spectrum Sensing for Cognitive Radio implemented using Deep Neural Network in python and GnuRadio. The project is funded by IEDC, India. It was also chosen by our department to participate in our Institute's Gold Medal Award for best <a href="#">B.Tech Project</a> |
| <i>January 2015-April 2017</i>   | <b>Vision based Path Planning of a <a href="#">AUTONOMOUS UNDERWATER VEHICLE</a></b><br><i>Department of Mechanical Engineering, NIT Rourkela</i><br>Designed the path planning module of the AUV using a stereo camera and Inertial Navigation sensors. Study and develop PID based control algorithms for stable motion and sensor fusion for perception. All coding is done on C++, ROS, and Qt platform and were optimized for GPU using CUDA-C. Our vehicle participated in the <a href="#">NIOT SaVe</a> competition 2017. <a href="#">Conference Paper</a> on our vision system was submitted and got selected at <a href="#">IEEE ICSPA 2017</a> , Malaysia  |
| <i>May 2015-April 2016</i>       | <b>Development of Embedded System for a <a href="#">BALLOON SATELLITE</a></b><br><i>Department of Electronics and Communication, NIT Rourkela</i><br>I was in charge of developing the embedded Sensor and Communication Subsystem of the Balloon Satellite. I worked on a 900 Mhz ZigBee trans-receiver known as Xtend and ARM-based microprocessors on UDOO Single Board Computers. Also, a Python-based software stack was developed to monitor the critical communication protocols like image transfer, sensor data transfer, etc   |

## TECHNICAL SKILLS

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Programming Languages:	C/C++, Python, Rust
Simulation Softwares:	Multisim, Matlab, NI LabView, GNU Radio
Operating Systems:	Linux, QNX RTOS.
Embedded System Software:	Arduino, Keil, Xilinx Vivado/ISE, TI Code Composer Studio
Source / Version Control :	git, IBM Rational-Team-Concert, Jira, Polarion.
Other :	ROS, OpenCV, Caffe, Qt, CUDA, Tensorflow, Ipython

## TEACHING EXPERIENCE

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- **CS313 Operating System Lab** Preparation and evaluation of assignments
- **EC375 Digital Signal Processing Lab** Evaluation of final submission of project work.

## COURSES COMPLETED

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- **THEORY :-** Basic Electronics , Signals and Systems, Analog Electronics, Semiconductor Devices, Digital Electronics, Computer Vision, Advanced Programming Skills, Microprocessors and Micro controllers, Digital Signal Processing, Embedded System Design, Analog and Digital Communications, Control Systems, Digital VLSI Design, Electromagnetic Theory, Embedded Computing System, Mobile Communications, Soft Computing, Computer Networks
- **Practical :-** Analog Electronics lab, Circuit Simulation Lab, Electrical Machines Lab, Thermodynamics Lab, Analog Communication Lab, Digital Signal Processing Lab, Microprocessor Design Lab, Digital Communications Lab, VLSI Design Lab, Mobile Communication Lab, Soft Computing Lab, Re-configurable IC Lab, Digital Radio Design Lab

## REFERENCES

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- **Dr. Shirshail Hiremath** :Assistant Professor, Electronics and Communication Department NIT Rourkela  
hiremaths@nitrkl.ac.in.
- **Dr. Hara Prasad Roy** :Associate Professor, Mechanical Engineering Department,NIT Rourkela  
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## DECLARATION

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All the information mentioned in the resume are correct to the best of my knowledge.

Place : Bengaluru, Karnataka

Date : 13/05/2020