Bhaskar Dutt
Curriculum Vitae

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💡 Objective

I am an applied HCI researcher, Currently working as a research assistant at Weave Lab IIIT Delhi. I always believe that perseverance beats talent. Therefore, I always try to learn and implement new technologies which can help the masses. My research Interest lies in *HCI(Tangibles & Wearables), Mobile Computing, Embedded systems, Wireless Networking & ubiquitous computing.*

📕 Education

Guru Gobind Singh Indraprastha University, India   2016 - 2020
Bachelor of Technology in Electrical & Electronics Engineering, GPA - 8.56/10.00

Kendriya Vidyalaya, Vigyan Vihar NFC, Delhi   2016
Class 12th (AISSCE) C.B.S.E, Percentage - 89.4%

☁ Technology Development Skills

- *Technologies:* Prototyping and tangible hardware development, Internet Of Things(**IoT**), Embedded systems, aerial autonomous vehicles, AR(augmented reality), 3D modelling in Blender, PCB Designing.

- *Programming Languages:* C/C++, Swift(iOS App Development), C(Unity), Python, LaTeX, Embedded C & MATLAB/Octave.

- *Hardware:* TI-cc3200 LaunchXL, Arduino Uno/Mega, NodeMCU ESP-12e/ESP8266, Esp32-Wroom-32D, STM32F4xx, **Linux Boards-** Nvidia jetson nano, Raspberry Pi 3b/Zero, Orange pi Zero, **Flight Controllers-** Pixhawk Px4, Matek f405 STD & Omnibus F4 pro.

- *Software:* MAVproxy/Mission Planner GCS, Blender, Autodesk EAGLE, Arduino IDE, Espressif IoT Development Framework, Atmel Studio, STM32CubeIDE/TrueSTUDIO, Octave, TeXstudio, etc.

- *Cloud used:* AWS IoT Core + DynamoDB, Mathworks ThingSpeak, Google's Firebase, etc.

💻 Selected Projects

ThirstyCrow(An AR Based Autonoumous Bot)
In this competition, every team has a specified theme like our is a thirsty crow and there are over 28000 participants in it out of which only 150 teams were selected for the finals at IIT Bombay and our project was selected for the finals. The project includes a bot called crow which uses atmega2560 microcontroller with LFR sensor to run on black line using the command which it gets from A algorithm through Zigbee protocol along with that its includes use of OpenCV, OpenGL for **AR(augmented reality)**.

Biped Bot(LQR Controller based self balancing bot)
LQR is a feedback-based controller used in place of PID controller due to its faster response time but it requires complex mathematics in the modelling, In this project, we successfully built the model and also implemented it using 8 Bit microcontroller and controlled using Xbee based remote controller.

RTK Correction Injection System
RTK or real-time kinematics is used to enhance the precision of position data derived from satellite-based positioning systems (global navigation satellite systems, GNSS) such as GPS, GLONASS, Galileo, NavIC and BeiDou. In **drone swarming** applications this plays a very vital role for centimetre level accuracy, Built using a ublox-m8p-2 module from here+, corrections are transmitted through NTRIP caster using RTCM data packages.

LoRaWAN Based Sensor Device
Lora (Long Range) is a low-power wide-area network (LPWAN) protocol developed by Semtech. My work includes building LoRa based sensor nodes for the device named **Ezio-statal** capable of implementing complex topologies and data transmission algorithms like **mesh, P2P, PEGASIS and LEACH**.

Wireless Communication System For Delhi Police
Built a modern **walkie talkie** for Delhi police along with a **Wi-Fi Ad-hoc network** for managing law and order, Demonstrated this device at Delhi police hackathon 2019 and won 1st prize for making a working prototype among 300+ teams, Also presented demo in front of Delhi police commissioner Amulya Patnaik.

Real-Time Pollution Monitor For Air Quality Measurements In Industries

This project includes a raspberry pi device as a local server to host an MQTT server as well as a webpage to connect various nodes through mosquitto broker, on the other hand, It uses Wi-Fi capable soc to interface with sensors like bme680, a sharp dust sensor and mq135 to measure the data like temperature, pressure, humidity, AQI, NO2, SO2, CO2, PM10&2.5 and send it to the server to log the data.

Wearable For Health Monitoring

This project uses ThingSpeak API and a UI centric app on software stack, On sensing side a heart rate sensor on a very small Wi-Fi SOC for small footprint ideal for a wearable.

💼 Employment Experience

Indraprastha Institute of Information Technology, Delhi, *Research Associate*   Dec 2020 - Present
Working under Dr. Aman Parnami at Weave Lab.

Botlab dynamics, IIT Delhi, *Intern*   Jan 2020 - Apr 2020
Worked as a R&D intern, Completed three projects.

Aerogram Pvt. Ltd., IIT Delhi, *Intern*   Aug 2019 - Dec 2019
Worked as an Embedded Firmware Intern, Built pollution monitoring devices and their network.

🏛 Research Publications

- **[1] Bhaskar Dutt**, Gauri Goenka, Aakash Awasthi. *"Research paper:Automation in factories using Internet of Things(IoT)."* At Journal of Emerging Technologies and Innovative Research (An International Open Access Journal) Paper ID A17, 2019

🏆 Recognition

1. 1st Position at **Delhi Police Hackathon 2019** facilitated by D.P commissioner Amulya Patnaik.
2. Merit Certificate holder for **E-Yantra Robotics Competition** IIT-Bombay 2018-19 and team leader for the only team selected for national finals from our college (out of 28000 participants) at pan India level.
3. Organizer of **T-HACK 2018**, Official Hackathon of IEEE ADGITM (Formerly NIEC).
4. Ex-Membership & project coordinator of IEEE ADGITM (Formerly NIEC).
5. Team lead for various Hackathon conducted across different colleges like Vihaan 2.0 DTU, IIT Delhi Hackathon and Arduino day Hackathon of BVPCOE etc.

✏ Extra-Curricular Activities

- Teaching Mathematics to high school students and helping juniors in various projects.
- Reading self help books, Technical articles and Biographies.
- Hiking and weight lifting.
- Blogging(*bhaskarsdose.wordpress.com*).

👥 Mentors

- **Dr. Aman Parnami**, Assistant Professor, IIIT-Delhi   *aman@iiitd.ac.in*
- **Dr. Sarita Ahlawat**, Scientist, BIRAC BIG Innovator, IIT-Delhi   *sahlawat@gmail.com*
- **Manoj Gulati**, Researcher, Living Analytics Research Centre (LARC)   *manojg@iiitd.ac.in*
- **Anuj Barnwal**, Founder, Botlab Dynamics-IIT Delhi   *anuj@botlabdynamics.com*