




# AASMAN BASHYAL

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## EDUCATION

**Pulchowk Campus, Institute of Engineering, Tribhuvan University**

*Nov 2017 – Apr 2022*

*Bachelor of Electronics and Communication Engineering*

*Lalitpur, Nepal*

## RESEARCH EXPERIENCE

**Angelswing Inc.**

*Jun 2022 – Present*

*Research Engineer*

*Seoul, Korea*

- Researched 3D indoor scene reconstruction using Neural Radiance Fields (NeRF), Gaussian Splatting, and Structure from Motion (SfM) techniques.
- Implemented a Modified architecture of the Segment Anything Model (50ms to 200ms latency) for masking large TIFF images, generating precise polygon masks, and improving the efficiency and accuracy of polygon drawing tools.
- Developed inspection system using You Only Look Once (YOLO) and detectron 2, achieving 73% accuracy in on-site defect identification.
- Designed dashboard and data pipeline for CX and business teams, enhancing overall productivity.
- Created architecture for 3D terrain model editing MVP, optimizing performance to achieve 1-3 second response time.
- Developed the snapping feature for Computer-Aided Design (CAD) overlay, improving the precision of measurement tools.

**KIAS**

*Apr 2021 – Sep 2021*

*Research Engineer Intern*

*Lalitpur, Nepal*

- Designed portable solar-powered ESP32 weather station for real-time data collection.
- Integrated sensors for meteorological data, enhancing accuracy with Kalman filtering.
- Applied XGBoost and RandomForest models for weather forecasting.

**Pulchowk Campus, IOE, T.U.**

*Nov 2017 – Oct 2021*

*Robotics Engineer*

*Lalitpur, Nepal*

- Led 21-member embedded and robot navigation team for ABU Robocon 2020, Fiji, and worked as a student team member for ABU- Robocon 2019, Mongolia, and ABU- Robocon 2018, Vietnam.
- Developed semi-autonomous navigation system for a four-wheel omni-drive robot, overseeing the integration of LiDAR, encoders, and IMU sensors.
- Engineered custom boards including motor drivers, and STM32-based development boards. Created additional function-specific boards (e.g., Schmitt trigger, pneumatic control).

## PROJECTS

**Automatic Modulation Classifier** | *Major project*

*2021 – 2022*

- Explored deep-learning techniques, focusing on Convolutional Neural Networks (ConvNets) and Long Short-Term Memory (LSTM) models for signal modulation classification.
- Engineered a hybrid CNN-BiLSTM network with an attention mechanism, achieving an impressive 82% accuracy in classifying signals with SNR from -6 to 18.
- Experimented with Quantum Neural Networks (QNN) for BPSK and QPSK signal classification.

**Simultaneous Localization and Mapping** | *Junior Year Minor Project*

*2020*

- Created a ROS package for LIDAR-based SLAM, enabling mobile robots to map and locate themselves in unknown environments.

**Smart Baby Cot** | *Junior Year Instrumentation Project* | *Team Lead*

*2019*

- Led the development of a Smart Baby Cot with cry detection, wet bed sensing, and automatic rocking; won the SDG Health Category award at LOCUS 2020.
- Implemented a CNN model for baby cry pattern recognition using spectrograms.

**Baag Chal and Bouncy Ball** | *Junior Year C++ and C Projects* | *Team Lead*

*2018 – 2019*

- Developed two games: 'Baag Chal' in C++, demonstrating object-oriented programming skills, and 'Bouncy Ball' in C, showcasing proficiency in fundamental C programming.

**Visual Light Communication System** | *LOCUS 2018 Project* | *Team Lead*

*2018*

- Engineered a Visual Light Communication (VLC) system for audio transmission, incorporating an audio-responsive LED transmitter circuit with an amplifier.

## LEADERSHIP AND TEACHING EXPERIENCE

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### IEEE Pulchowk Student Branch

2020 – 2021

- As President (2021), led various technical and professional development initiatives, successfully launching 4 major technical workshops.
- As head of the Membership Committee in 2020, I organized efforts that grew our membership by 40%.

### Mentoring at Robotics Club

2021 – 2022

- Mentored the team for ABU Robocon 2021, achieving second runner-up position.
- Guided the team for ABU Robocon 2022, focusing on innovative design and teamwork.

### Lead Instructor and Course Designer

2020 – 2021

- Launched and delivered specialized hardware curriculum for first and second-year students.
- Fostered practical learning by collaborating with Locus and representing the Robotics Club.
- Led engaging, interactive classes for primary students at Junior School GRS over 2 weeks.

### Mentor Training

2018

- Represented IOE as participate, in "Mentor Training to Foster Logical and Creative Thinking Using ICT in Basic Education" by Masatoshi Suzuki, Japan.

## AWARDS AND SCHOLARSHIP

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**Tokyo Electron Award** (2020): Outstanding robotic design, ABU ROBOCON, Fiji.

**ROHM Award** (2019): Technical innovation in circuit design, ABU ROBOCON, Mongolia.

**Best Shuttlecock Award** (2018): Innovative mechanism design, ABU ROBOCON, Vietnam.

**Winner, SDG Health Category** (LOCUS 2019): For a project contributing to infant care.

**Second Position**, Inter-college Soldering Competition: Demonstrated exceptional skills in soldering.

**Mahatma Gandhi Scholarship**: Received from the Indian Embassy for academic excellence in high school.

## SKILLS

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**Programming Languages:** Python, C, C++, JavaScript, Matlab, SQL

**Frameworks:** TensorFlow, PyTorch, Matplotlib, OpenCV, Pandas, SciPy, Numpy, Scikit-learn

**Frontend & Backend:** HTML, CSS, FastApi, Threejs

**Tools & Database:** AWS (EC2, S3), Docker, GIT, Grafana, InfluxDB, PostgreSQL, Linux

**GIS & Embedded Systems:** QGIS, GDAL, Embedded C, KiCad, Proteus, STM32CubeMX, Keil Microvision, Arduino, ROS, Raspberry Pi

**Additional:** Node-Red, LaTeX, Inkscape, Microsoft Office, Canva, MS Teams, Slack, Jira