

# ANWESH BADAPANDA

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## EDUCATION

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### Bennett University

Bachelor of Technology : Computer Science and Engineering

CGPA: 9.11/10.00

Greater Noida, India

Jul 2019 - May 2023

## EXPERIENCE

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### Indian Institute of Technology

Research Assistant (Advisor: Prof Vireshwar Kumar)

New Delhi, India

Jun 2023 - Current

- Developing **deep learning based network intrusion detection systems** and **anomaly detectors** for **In-Vehicular Networks**.
- Researching ways to leverage **computer vision models to identify attacks** by interpreting network traffic as images.
- Carrying out **literature survey** and **developing adversarial models** to evaluate current intrusion detection systems.
- Working on developing a **smart adversarial attack strategy** to deceive traditional network intrusion detection systems.

### Georgia Institute of Technology

Research Intern (Advisors: Prof Wenke Lee and Prof Saman Zonouz)

Atlanta, Georgia

Sep 2022 - May 2023

- Developed a **Variational Autoencoder** based on **multi-head attention** and **physics informed losses** to identify attacks and anomalies in **Cyber-Physical Systems**.
- Achieved a **detection accuracy of 98.3%** and a **false positive rate of 0.8%**, over 11 different industrial processes, beating current state of the art methods. [Manuscript under revision]
- Investigated **anomaly detection** in PowerGrid Human Machine Interfaces through the use of segmentation models such as **UNet** and **Mask-RCNN**.
- Contributed in the development of a tool to **monitor and analyze SCADA processes to detect malicious activities** using Windows Process Monitor.

### Deloitte India

Data Science Intern

Remote

Jul 2022 - Dec 2022

- Performed **predictive & descriptive analytics** for Audit & Advisory division.
- Used **Python** and **Microsoft Excel** to preprocess raw data provided by clients.
- Created dashboards on **PowerBI** to visualize and analyze data.
- Assisted Advisory Management team in the **analysis and visualization of payroll data** for multiple clients across multiple industries.

## PREPRINTS

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- Pulkrit Vyas, Chirag Saxena, **Anwesh Badapanda**, Anurag Goswami. "**Outdoor Monocular Depth Estimation: A Research Review.**" arXiv:2205.01399 [cs.CV]

## PROJECTS

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### Video Based Human Activity Recognition

<https://github.com/anweshb/activity-recognition>

- **Preprocessed over 1000 video clips** by extracting **resized and normalized frames** using custom functions, ensuring **model compatibility** and **performance**.
- Developed a **spatio-temporal attention based neural network** to classify video sequences into one of seven activities.
- Used **temporally distributed** custom CNN layers for **spatial feature extraction** and multi-head attention block for **temporal feature extraction**.
- Achieved an **average accuracy of 98.37%** with **0.99 average precision, recall and F1 scores** over all seven classes.

## Super-Resolution for Lung CT Scans

[https://github.com/anweshb/CT\\_SRGAN](https://github.com/anweshb/CT_SRGAN)

- Implemented a **Super-Resolution Generative Adversarial Network** for upscaling **CT Scans of lungs** with a 2x upscaling factor.
- Developed a **custom training loop** and content loss function to maximize **perceptual similarity** by using **VGG19 feature maps**.
- Achieved a **PSNR score of 30.074** and **SSIM score of 0.963**, and made comparisons to classical interpolations techniques.

## Monocular Depth Estimation and Object Detection

[https://github.com/anweshb/GAIP\\_Project](https://github.com/anweshb/GAIP_Project)

- Developed a visual aid tool to help the visually challenged avoid obstacles using **Depth Estimation and Object Detection**
- Used pre-trained MiDAS model and fine-tuned **YOLOv5** to custom dataset and achieved a **mAP of 67%**.
- Deployed the project to **Streamlit** to demonstrate possible real-time use.

## RoboCop

<https://github.com/anweshb/NCoders-Robocop>

- **Developed** a robust facial recognition system using **OpenCV** for efficient intruder detection.
- **Implemented** the model on a **Raspberry Pi** for real-time, on-device functionality, ensuring practical usability.
- **Integrated** a local image database with **Firebase**, enabling convenient viewing of detected faces via a dedicated mobile application.

## ACHIEVEMENTS AND AWARDS

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- Recipient of **academic excellence scholarship** worth a total of 420,000 INR over 4 years at Bennett University.
- In the **dean's list for a total of 4 semesters** for **ranking in the top 1%** in the School of Computer Science at Bennett University.

## POSITIONS OF RESPONSIBILITY

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### Co-President and Co-Founder

*Bennett Artificial Intelligence Society*

Greater Noida, India

*Jan 2020 - Aug 2022*

- Co-founded a club to promote **undergraduate research** in the field of **Artificial Intelligence**.
- Organized workshops, faculty talks, weekly reading groups and other events.

### Undergraduate Teaching Assistant

*School of Computer Science*

Greater Noida, India

*Mar 2022 - May 2022*

- Conducted labs for **Object Oriented Programming with Java(CSET104)** course.
- Handled student inquiries and concerns, providing **clear and accurate explanations** to resolve doubts related to course materials, assignments, and assessments.
- Assisted in organizing and **preparing lab assignments**, ensuring accuracy and clarity in instructions, and subsequently **graded student submissions**.

## SKILLS

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**Programming Languages:** Python, Java, C++

**Frameworks and Libraries:** TensorFlow, Keras, Scikit-learn, Pandas, Matplotlib