

# ABU BAKAR SIDDIK NAYEM

H #5, R #3A, Ranavola, Turag, Dhaka 1711 || P: +880-1733538404 || E: [nayem.abs@gmail.com](mailto:nayem.abs@gmail.com)

## PROFILE

Machine Learning Engineer with expertise in end-to-end machine learning lifecycle management, advanced deep learning models, and geospatial analysis. Experienced in leading high-impact projects funded by prestigious organizations like the Bill and Melinda Gates Foundation and Australia Awards. Proficient in developing ML solutions for diverse domains including agriculture, healthcare, and disaster management.

## POINTS OF INTEREST

1. Spearheaded the development of an image to weight estimation model for livestock, funded by the Bill and Melinda Gates Foundation, facilitating accurate weight predictions for farmers globally.
2. Led cancer detection research from OPG X-ray and CT scans, supported by an Australia Awards grant.
3. Developed a demographic data visualization dashboard for Bihari Camp using Flask, PostgreSQL, and Vue.js.
4. Secured data security and compliance certifications including GDPR, HIPAA, ISO 27001, and ISO 9001 for Acme AI Ltd.

## EXPERIENCE

### Acme AI Ltd

Machine Learning Engineer

Dec 2021 – Present

Dhaka, Bangladesh

- + **AI Product Development:** Developed an open-source AI-based livestock weight detection system using smartphones – enabling provisions of accurate livestock inputs and market system transparency at the grassroots; the system won a Gates Foundation Global Grand Challenge amounting to USD \$246,000~. Deployed models using Flask and FastAPI on GCP App Engine and Compute Engine in Docker containers
- + **Product Lifecycle Management:** Manage the end-to-end implementation and ongoing updates of machine learning systems to leverage new technological advancements and research
- + **Oral Cancer Detection Research:** Investigate cancer detection from OPG X-ray and CT scans funded by an Australia Awards grant
- + **Demographic Data Dashboard:** Create a Bihari Camp demographic data visualization dashboard using Flask, PostgreSQL, and Vue.js
- + **Dataset Management and Curation:** Prepare dataset specifications and manage data acquisition, annotation, quality assurance and custom export formats at scale using Superannotate, V7, Supervisely, and CVAT
- + **Team Guidance:** Provide guidance to team members on utilizing various machine learning tools such as Pose Estimation, Semantic Segmentation and Large Language Models to achieve project goals
- + **Security and Compliance:** Achieve data security and compliance certifications for the company, including GDPR, HIPAA, ISO 27001, and ISO 9001
- + **Partnership Development:** Developed local and transnational partnerships with Ailytics, xpertSea, Mpower Social Enterprise and Bhalo Social Enterprise
- + **Project Leadership:** Serve as project manager to high-stakes grant-funded activities and delivered large annotation projects amounting to over 450,000 hours of work

### Center for Computational and Data Sciences (CCDS)

Independent University Bangladesh (IUB)

Research Assistant: ML, Computer Vision and GIS

May 2019 – Nov 2021

Dhaka, Bangladesh

- + **Deep Learning Analysis:** Conducted extensive analysis on advanced deep learning models, focusing on transfer learning and optimized architectures for enhanced performance. Prepared and processed satellite and aerial imagery for training and testing deep learning models. Provided oversight and guidance to student teams in dataset creation and project fulfilment
- + **Field Data Collection and Verification:** Undertook in-field GPS data collection and processing to ensure the accuracy and reliability of collected geospatial data for research purposes
- + **Disaster Imagery Analysis:** Collected, annotated, and classified natural and man-made disaster imagery using CNN-based models, contributing to disaster response and management efforts
- + **GPU-Enabled Computing Server Management:** Configured and managed GPU-enabled High-Performance Computing (HPC) and Super Computing clusters, optimizing computational resources for efficient data processing and analysis
- + **Urban Categorization Research:** Conducted research in collaboration with University of Tokyo and United Nations University on urban categorization methods utilizing machine learning algorithms and geospatial analysis techniques. Investigated factors such as population density, land use patterns, infrastructure development, and socioeconomic indicators to classify urban areas into distinct categories. Analyzed satellite imagery and GIS data to identify spatial patterns and trends, contributing to urban planning and development strategies

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- + **Crop Monitoring and Yield Prediction:** Utilized remote sensing techniques for crop health monitoring and yield prediction, leveraging satellite imagery to support agricultural decision-making processes
- + **Land Use/Land Cover Segmentation:** Conducted comprehensive land use/land cover segmentation analysis for Bangladesh, providing valuable insights into land utilization patterns and environmental changes
- + **Geospatial Data Processing:** Cleaned, georeferenced, processed, and analyzed geospatial data, ensuring data integrity and reliability for research and analysis purposes
- + **Neural Network Explainability:** Explored the explainability and interpretability of neural networks in geospatial analysis, enhancing the transparency and trustworthiness of AI-driven models and results
- + **Spatial Database Development:** Developed and managed spatial and temporal databases, facilitating efficient storage, retrieval, and analysis of geospatial data for research projects
- + **GPS Device Management:** Managed GPS devices and conducted data collection and processing, ensuring the accuracy and reliability of geospatial data used in research activities
- + **Disaster Imagery Collection and Classification:** Collected, annotated, and classified disaster imagery using CNN-based models, contributing to disaster preparedness and response efforts through accurate and timely analysis of imagery data

## EDUCATION

**Independent University Bangladesh, School of Engineering, Technology, and Sciences**

Sept 2015 – April 2019

Dhaka, Bangladesh

Bachelor of Science, Computer Science, Mechatronics & Robotics

Thesis: Land Use and Land Cover Segmentation Using Deep Neural Network

## PUBLICATION

BD-Sat: High-resolution Land Use Land Cover Dataset with Benchmark Results for Developing City of Dhaka, Bangladesh.	Proceedings
<a href="#">Deep-learning framework customized for novel categorization method to classify cities of the developing world</a> <i>Sensors Journal, MDPI</i>	2021
<a href="#">A Novel Disaster Image Data-set and Characteristics Analysis using Attention Model</a> <i>International Conference on Pattern Recognition (ICPR)</i>	2021
<a href="#">Deep-learning coupled with novel categorization method to classify the urban environment of the developing world</a> <i>International Conference on Signal Processing and Machine Learning</i>	2021
<a href="#">LULC Segmentation of RGB Satellite Image Using FCN-8</a> <i>SLAAI-International Conference on Artificial Intelligence</i>	2019

## CERTIFICATION/TRAINING

ISO 9001 Quality Management System Training	April 2023
ISO 27001 Information Security Management System Training	April 2023

## SKILLS

<b>Programming Language</b>	Python, C++, Java, Matlab, JavaScript, MongoDB, SQL
<b>Framework</b>	PyTorch, TensorFlow, Keras, Flask, FastAPI, Celery, Node.js, Vue.js
<b>Library</b>	OpenCV, Scikit-learn, NumPy, Pillow, Pandas, Matplotlib, Selenium, GDAL, Bootstrap
<b>Geospatial Analysis</b>	QGIS, ArcGIS Pro, Arcmap, eCognition, Google Earth Engine
<b>Other</b>	Google Cloud Platform, Docker, RabbitMQ, LaTeX, Git, Shell scripting, SSH, PostgreSQL
<b>Language</b>	Bengali (Native), English (Fluent)
<b>Github</b>	<a href="#">Click here</a> to check out my github profile.
<b>LinkedIn</b>	<a href="#">Click here</a> to check out my LinkedIn profile.

## REFERENCES

<b>Syed Sadhli Ahmed Roomy</b> Co-founder and COO Acme AI Ltd. Mirpur DOHS, Dhaka - 1216 Phone: (+880) 1310519597 Email: <a href="mailto:sadhli.roomy@gmail.com">sadhli.roomy@gmail.com</a>	<b>A K M Mahbubur Rahman</b> Associate Professor Department of Computer Science & Engineering Independent University Bangladesh (IUB), Dhaka - 1229 Phone: (+880) 1904017955 Email: <a href="mailto:akmmrahman@iub.edu.bd">akmmrahman@iub.edu.bd</a>
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