Pravakar Bogati

Mechanical Engineer

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With a strong foundation in mechanical engineering and a passion for art and design, I embrace the philosophy of being a *polymath*—constantly expanding skills across diverse fields to drive innovation.

My experience spans mechanical systems, manufacturing processes, and materials science. In addition, I have a growing focus on AI/ML technologies, specializing in data analysis, predictive maintenance, and fault detection through machine learning models. I thrive on integrating advanced analytics with engineering solutions to optimize performance and reliability.

EXPERIENCE

Research and Engineering Intern

Kathmandu

Rastriya Urja Dakhsta Kendra

Mar, 2025 - Present

- Conducted feasibility studies on cogeneration potential in various industries.
- Analyzed energy consumption patterns and identified efficiency improvement opportunities.
- Assessed technical and economic viability of cogeneration systems.

Tools: Python, openLCA, TRNSYS, SketchUP, SolidWorks

Country Head of Marketing

Nepal

AIESEC

Jun, 2023 - Jul, 2024

- Developed and executed the national marketing strategy, launching **aiesec.org.np** achieving a 300k+ digital footprint and driving 200% year-over-year growth in engagement and outreach.
- Generated total revenue of NPR 7.5 million through strategic partnerships and summits.
- **Led 200+ youths** enhancing youth leadership and talent development programs through strategic partnerships, contributing to a 20% growth in program participation.
- Established new systems and processes to ensure 100% compliance with national audits, enhancing operational transparency and efficiency.

Tools: Google Analytics, G Suite, MailChimp, Python, WordPress, Adobe Suite, Canva, Office Suite.

Chair Secretary

Kathmandu

Rotaract

Jul, 2021 - Jul, 2022

- Developed a mechanical device to help daily porters carry weighted bricks and worked on providing an ambulance for the underprivileged.
- Awarded Best Department Head for consecutive quarters, **led 70+ members** facilitating over 70 events with virtual engagements exceeding 10,000 participants in a single event.
- Received the Diamond Club Award for outstanding contributions and achieved 100% audit completion.
- Volunteered in the COVID-19 support team and organized welfare donations to assist those in need.

Tools: Zoom, Google Meet, Trello, Canva, MS Office Suite, CAD.

EDUCATION

Mechanical Engineering

Dhulikhel

Kathmandu Univeristy

Jan, 2021 - Jan, 2025

Specialization in hydropower engineering and energy systems.

+2 Science

Lalitpur

Prasadi Academy

Apr, 2018 - Nov, 2020

GRADE: 3.78/4 CGPA
College Perfect – Awarded for two consecutive years.
Outstanding academic performance above 90% of the batch.

NEB Lalitpur

AVM School Jan, 2007 - Dec, 2017

GRADE: 3.80/4 CGPA
Secured many gold medals in all-Nepal inter-school quiz competitions and chess competitions.
Secured above 90% in the batch, ranking among the top students as school perfect.

PROJECTS

Early Stage Fault Detection in Turbines using AI/ML

- On process paper publication with use of AI/ML model for early-stage fault detection in turbines, leveraging sensor data to predict potential failures and enhance predictive maintenance.
- Analyzed patterns in vibration and temperature signals to detect anomalies, identifying issues like bearing wear and imbalance before they escalate.
- Utilized machine learning algorithms to create a system that continuously monitors turbine health, minimizing downtime and optimizing maintenance costs.

Tools: Python, TensorFlow, MATLAB.

AI/ML for Prediction of Performance of Metal Hydrides for Hydrogen

- Collaborated on a study using machine learning to predict the performance of metal hydrides for hydrogen storage. Developed a dataset from secondary sources and the Materials Project database, focusing on the discharge capacity of La-Ni-Mg Alloy after 100 cycles. Analyzed data with four regression models, achieving the highest accuracy with Support Vector Regression (adjusted R-Squared: 0.9619).

Tools: Orange, Python, Materials Project Database, Origin.

Reverse Engineering of Pelton Turbines

- Conducted the disassembly of a corroded 300-watt Pelton turbine and modeled it for a 30 MW Pelton turbine at Khimti. This project involved presenting a paper to be published in IOP Science, linked to USC, focusing on using molding and 3D scanning techniques to validate the reverse engineering process of hydro turbines.

Tools: EinScan HX, SD modeling, Fiber molding, 3D printing, Molding, Paper writing, and Casting.

Review Paper on Thermal Analysis of Industrial Boilers

- Collaborated with colleagues from Kathmandu University to investigate the critical role of industrial boilers in providing steam and heat for operations. The review emphasizes the significance of thermal performance on efficiency, operational costs, and environmental impact.

Keywords: Thermal Analysis, Industrial Boiler, Comparisons

Review Paper on The scope of EV in Nepal

- Authored a study investigating the transition to electric vehicles (EVs) in Nepal, assessing consumer preferences, energy costs, and regulatory impacts. Key barriers identified include inadequate charging infrastructure and low consumer awareness. Insights aim to inform policy and enhance EV adoption.

Keywords: Electric vehicles, Infrastructure development, Air pollution, Energy efficiency, Policy

Gradient Index Glass and its Applications

- Researched gradient index (GRIN) glass for its applications in fiber optics and endoscopy. Analyzed the bending of light due to refractive index variations and investigated manufacturing challenges.

Keywords: Optics, Bending of Light, Refractive Index, Graded-Index Optics, Glass.

ACHIEVEMENTS

Scholar Conference Presentation

Paper presentation on AI for Prediction of Performance of Metal Hydrides for Hydrogen.
Paper presentation on Reverse engineering of Pelton Turbines
Poster presentation on Review Paper for The Scope of EV in Nepal.

Paper presentation on Review Paper on Thermal Analysis of Industrial Boilers.

Best Delegate for Delegation Japan

Participated in a Leadership Dialogue hosted by AIESEC Japan with 300+ youths from 5 countries; was awarded a 6-week French language course and exclusive delegate merchandise.

TRAINING/CERTIFICATIONS

Research Paper Writing 2024

Kathmandu University

Completed a 3-day workshop led by professors, focusing on research paper writing techniques using LaTeX, Mendeley, and Zotero.

Leadership Summits for Youth 2024

Asia Pacific Summit , AIESEC

Participated with youths from 21+ countries in organizational management strategies and leadership development.

CAD & CAM 2022

Association of Mechanical Engineering

Completed a 3-day intensive course focusing on advanced design and manufacturing techniques.

SHINE 3D EinScan HX

Design Lab, Kathmandu Univeristy

Marketing Hub Mastery 2022

AIESEC Global Certification, Canada

Design Theory 2022

Kathmandu University

AWARDS

District Member Topper Lalitpur

Millennium Co. & Bishundol Co. 2020

Awarded for Academic Excellence

SKILLS

Mechanical Design, AI/ML, Finite Element Analysis, Research paper writing, CAD & CAM, Drafting, Graphics Designing, Content Creation, Computational Fluid Dynamics (CFD), Python, Canva, G suite, C/C++, MATLAB, organizational management, Marketing, adobe suite, OpenFoam, Data Annotation, Data Analysis, Prompt Writing, Statistical Analysis, CHP Design, Renewable Energy Management & Research Energy Efficiency

LANGUAGE

English, Nepali, Hindi

REFERENCES

Dr.Sailesh Chitrakar - *Prof. Supervisor*

Kathmandu Univeristy
sailesh@ku.edu.np

Satkar Raj Shrestha - *CEO 2024*

AIESEC
satkar.rajshrestha@aiesec.net

Prabesh Baniya - *ZRR Rotaract*

GIST: Gwangju Institute of Science and Technology
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