

BADAI CHARAMSAR NUSANTARA

Medan | badainusantara9@gmail.com

+62 812 7688 109 | www.linkedin.com/in/badai-nusantara-a3ba9116a |

<https://scholar.google.com/citations?hl=id&user=REdQ2QQAAAAJ>

A Mechanical Engineering graduate with solid expertise in manufacturing systems, mathematical modeling, and data-driven optimization, currently pursuing a Master's degree in Mechanical Engineering at Universitas Sumatera Utara with a focus on advanced manufacturing and sustainable technology. Experienced in design engineering, computational analysis, and research with multiple Scopus-indexed publications. Skilled in Python, MATLAB, and SolidWorks, with strong analytical and project coordination abilities. Recognized for combining technical precision, academic depth, and practical field experience in developing innovative and community-based engineering solutions.

EDUCATION

Universitas Sumatera Utara, Medan

Feb 2023 – Jan 2026

Magister of Mechanical Engineering | GPA: 3.71/4.00

- Key Courses: Advanced Manufacturing Processes, Engineering Analysis, Advanced Machining Processes, Applied Numerical Methods, Polymer and Composite Manufacturing Processes, and Data Acquisition Systems.
- Thesis: Prediction of Tool Wear Evolution and its Relationship with Surface Roughness in the Turning of Super Duplex Stainless Steel 2507 using Machine Learning.

Universitas Andalas, Padang

August 2015 – Nov 2021

Bachelor of Mechanical Engineering | GPA: 3.09/4.00

- Key Courses: Computer and Programming, Engineering Design, Manufacturing Engineering, Engineering Mathematics, Control Engineering, and Metrology and Quality Control.
- Thesis: Optimization of Hot Air Coffee Roast Machine Using PLC Control System.
- TOEFL Score: 530

PUBLICATION

Scopus-Indexed Publications:

Study of Novel Normalization Technique on Weighting and Ranking Methodology in Multi-Criteria Decision Making: Several Cases in Financial Performance

- Croatian Operational Research Review (Scopus Q3), 2026
- This study proposes the Root Distance Ratio (RDR), a novel normalization technique for MCDM, to improve weighting stability and ranking consistency in financial performance evaluation, particularly when datasets contain negative values.

Mapping Regional Stunting Interventions in Indonesian Provinces: An MCDM Approach with PCA and Entropy Weighting

- Journal of Systems Science and Information (Scopus Q4), 2025
- This study integrates PCA and Entropy weighting with MARCOS, COPRAS, and WASPAS methods to evaluate provincial capacity in addressing stunting in Indonesia, highlighting key intervention indicators and supporting evidence-based regional policy decisions.

Dynamics Of Rainfall And Temperature In North Sumatra Province: Comprehensive Analysis Of Temporal Trends

- BAREKENG (Scopus Q4), 2025
- This study provides a comprehensive insight into the dynamics of rainfall and temperature in North Sumatra Province using a temporal trend analysis approach.

Ranking Quality of Life Index in Indonesian Provinces: A Multicriteria Approach for Sustainable Regional Development

- Sustainable Development Journal (Scopus Q1), 2025
- This research applied multicriteria decision-making methods to analyze the Quality of Life Index in Indonesian provinces, contributing to sustainable regional development.

Comparative Analysis of Response Surface Methodology (RSM) and Taguchi Method: Optimization Hydraulic Ram Pump Performance

- Operations Research Forum (Scopus Q2), 2024
- This study compares two optimization approaches, Taguchi and Response Surface Methodology (RSM), in identifying and optimizing the performance parameters of a hydraulic ram pump.

Comparative analysis of QUEST and CHAID decision tree methods in assessing the performance of conventional commercial banks

- Songklanakarin Journal of Science & Technology (Scopus Q3), 2024
- This study examines two decision tree-based classification approaches, QUEST and CHAID, in assessing the performance of conventional commercial banks

SINTA-Indexed Publications:

Integrating Education, Technology, and Sustainable Practices for Community Empowerment in Siponjot Village

- ABDIMAS TALENTA: Jurnal Pengabdian Kepada Masyarakat (Sinta 5), 2025
- This study integrates linear regression analysis with a ranking approach of Asian countries based on World Development Indicators in relation to the Human Development Index. This study integrates education, digital technology, and sustainable community practices to support community empowerment and improve learning accessibility in Siponjot Village.

Influence of World Development Indicators on Human Development: A Multiple Linear Regression and PSI Ranking Approach

- ZERO: Jurnal Sains, Matematika dan Terapan (Sinta 2), 2025
- This study integrates linear regression analysis with a ranking approach of Asian countries based on World Development Indicators in relation to the Human Development Index.

Other Publications:

Optimization of Hot Air Coffee Roast Machine Using PLC Control System

- Repository Unand, 2021
- This research designed and developed a coffee roasting machine utilizing a PLC-based control system and hot-air heating mechanism, optimized through a Taguchi experimental design approach.

SKILLS

Technical Skills:

- **Engineering:** Welding, turning, measurement, and manufacturing design
- **Statistics:** T-Test, Z-Test, Chi-Square Test, ANOVA, Regression, Histogram Analysis, Classical assumption testing, clustering, machine learning (supervised & unsupervised)
- **Mathematics:** Optimization, Goal Programming, Linear Programming, Decision Theory, Mathematical Modeling, Multi-Criteria Analysis (MADM/MCDM & MODM).
- **Web Development:** HTML5, CSS3, basic front-end development, website structure design, and responsive web page editing.
- **Software:** Python, Fortran, IBM SPSS, Smart PLS, MiniTab, eViews, VosViewer, Microsoft, SolidWorks, Google Colab, R Studio, MATLAB, Arduino IDE, CX-One (Ladder Diagram PLC), Visual Studio Code.

- **Language:** Bahasa Indonesia (Native), English (Proficient).

Soft Skills:

- Analytical thinking and problem-solving
- Quantitative and qualitative research analysis
- Project coordination and time management
- Leadership and cross-functional collaboration
- Effective and persuasive communication
- Community facilitation and engagement
- Adaptability and continuous learning mindset
- Environmental and sustainability awareness

ORGANIZATIONAL EXPERIENCE

SANGKALA, Outdoor and Environmental Community in Medan

Head of Dinamika Sanggar Division

December 2016 – Present

- Led division activities related to community dynamics, member development, and organizational engagement.
- Coordinated environmental, humanitarian, and nature-based education programs
- Supported SAR (Search and Rescue) training, outdoor education, and community outreach in rural areas.

TELAPAK Indonesia, (NGO – Ecolabel & Sustainability)

Member

Jun 2017 – Present

- Participated in national environmental movements and sustainable development campaigns.
- Promoted awareness of eco-labeling and community-based environmental management.

Mechanical Engineering Student Association (HMM), Universitas Andalas

Member Development Division

Desember 2016 – August 2019

- Contributed to internal student development and recruitment programs.
- Coordinated regeneration activities to strengthen student leadership capacity.

Student Executive Board, Faculty of Engineering (BEM FT UNAND)

Head of Research and Strategic Action Department

August 2017 – July 2019

- Led strategic initiatives and policy studies on student and national issues.
- Supervised advocacy projects and built collaboration with other student organizations.

PAITUA – Student Nature Lovers, Faculty of Engineering UNAND

Trainee Member

Feb 2017 – Jan 2018

- Participated in environmental awareness, climbing, and survival training.
- Supported conservation and outdoor education activities.

PROJECT, RESEARCH, AND PROFESSIONAL EXPERIENCE

Website Development Projects - Medan

Website Developer | Independent Web Development Projects

Jan 2026 – Present

- Developed and launched websites including Konektago.com, Yayasanleuserlestari.org, Klariva.id, and several projects deployed through Vercel.
- Designed and developed responsive websites and landing pages for business, nonprofit, and professional service platforms.
- Built and customized website structures, page layouts, content sections, and visual interfaces using web development tools and front-end technologies.

- Managed website deployment, domain integration, content updates, and basic optimization to improve accessibility, presentation, and user experience.

Cinyris Farm and Beans Rebranding Project - Medan

Project Manager | Brand Development and Rebranding Project

May 2026

- Managed the rebranding process of Cinyris Farm and Beans, including brand positioning, visual identity direction, and communication strategy.
- Coordinated project planning, creative development, and implementation stages to strengthen the brand's market presence.
- Collaborated with internal and external contributors to align brand identity with business values, product character, and customer engagement goals.

Optimization of Hydraulic Ram Pump Performance Using Brachistochrone Pipe Geometry and Machine Learning, Research in Universitas Sumatera Utara

Researcher

May 2025 – Sept 2025

- Developed an experimental design integrating geometric optimization for improved hydram pump efficiency.
- Analyzed performance parameters through computational and physical testing.

“Marsiajar Manang Didia Pe” Learning System Project – Siponjot, North Sumatra

Community Facilitator

May 2025 – August 2025

- Developed a flexible community-based learning system emphasizing accessibility and digital engagement.
- Led workshops to empower local educators and students in non-formal education environments.

Research Team, Universitas Sumatera Utara

Research Associate (Scopus-Indexed Projects)

August 2023 – August 2025

- Conducted interdisciplinary research in manufacturing, optimization, and applied mathematics.
- Co-authored multiple Scopus-indexed publications across Q1–Q4 categories.

Research Data Analyst, Medan

Independent Project-Based Work

October 2022 – August 2025

- Conducted statistical data processing and analysis for research and industrial projects.
- Provided interpretation and visualization of analytical results to support decision-making and publication.

Automated Mushroom House Development, Community Service Organized By The University Of North Sumatra

Technical Facilitator

Jun 2023 – December 2023

- Designed and implemented Arduino-based automation system for humidity and temperature control.
- Trained local residents to operate and maintain the system independently.

Freelance / Remote Engineering Team

Design Engineer (Piping and Pump Systems)

August 2022 – May 2023

- Created mechanical and piping designs for pump systems using Solidworks software.

Fulfillment of Community Drinking Water Capacity in Sembahe Using Environmentally Friendly Hydraulic Ram Pump Technology - Sembahe, North Sumatra

Technical Consultant

April 2022 – December 2022

- Designed and supervised hydram pump installation to improve rural water accessibility.
- Provided community-based training on operation and maintenance.

PT Semen Padang – Maintenance Department, Padang

Intern

Nov 2019 – Jan 2020

- Assisted in machinery maintenance scheduling and efficiency analysis.
- Supported preventive maintenance documentation and improvement planning.