Mend-Amar Badral

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Education

Budapest University of Technology and Economics (BME) Sep, 2025 – June, 2027
M.S. in Computer Science Engineering Advisor: Márton Vaitkus

National University of Mongolia (NUM) Sep, 2021 – June, 2025
B.S. in Applied Mathematics Advisor: Galtbayar Artbazar
Thesis: Evaluating land degradation using image processing methods

Experience

Center of Mathematics Application Research Laboratory at NUM Oct, 2023 - June, 2025
Internship

- Formulated an image processing pipeline in Python to quantify plant types (grass, weeds, and soil) from drone imagery using segmentation methods such as thresholding, K-means clustering, and Moran's I spatial autocorrelation.
- Identified bare ground and grass using optimized thresholding methods, and detected weed through spatial clustering (Moran's I: 0.58–0.70).
- Demonstrated that the spatial patterns of weed growth can be effectively captured and quantified using Moran's I coefficient.
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- Analyzed and experimented with a Python-based image processing library from the drone vendor, exploring OOP design principles (e.g., encapsulation and modularity) to understand library structure.
- Conducted independent code refactoring for the research experimentation code to enhance clarity and reduce complexity while maintaining functionality.
- Authored comprehensive laboratory handbook and technical documentation for knowledge transfer to future team members.

Projects

Deep Learning Foundations and Concepts Book Figures Reproduction

- Self-initiated project to reproduce key examples from C.Bishop and H.Bishop's *Deep Learning Foundations and Concepts* book to gain theoretical and fundamental understanding of neural networks, deep learning, and optimization.
- Published reproducible Jupyter and Pluto.jl notebooks on GitHub, emphasizing clear explanation, interactivity, and visualization.

Skills

Programming languages:	Python, Julia, C, C++, JavaScript
ML frameworks:	PyTorch
Web development/design:	ReactJS
Markup:	Markdown, Quarto, LaTeX
Databases, tools:	SQLite, OpenCV, Git, Vim
Strong background in:	Mathematics, Digital Image Processing