

My Research Journey This Semester

From Initial Proposal to Implementation Plan

Student: Mohammad Wajeesh Bader (251000462)

Supervisor: Dr. Amjad Qataish

Program: Master of Science in Artificial Intelligence

College: College of Informatics, Midocean University

How My Understanding Evolved

1

Week 1-2

Initial proposal and idea formation

2

Week 3-6

Systematic literature collection and analysis

3

Week 7-9

Scientific paper writing and methodology refinement

4

Week 10-12

Project 2 proposal development and planning

How each step built upon the previous one and shaped my final research direction

Where It All Began

Original Concept

"Use AI for carbon emission estimation" - A vague understanding of available methods with unclear specific approach or contribution.

Initial Challenges

- Too broad scope
- Limited knowledge of existing research
- Uncertainty about feasibility and novelty

Key Question

"What has already been done, and where can I contribute?"

Discovering the Research Landscape

1

Phase 1

General searches ("AI carbon emissions")

2

Phase 2

Refined techniques (ML, satellite imagery)

3

Phase 3

Recent advances (2016-2025)

What I Discovered

- 21 highly relevant studies identified
- Multiple methodological approaches exist
- Clear performance benchmarks available
- Research gaps became visible

Turning Point

Realized the importance of systematic methodology selection based on evidence rather than assumptions.

What the Literature Taught Me

Algorithm Performance Patterns

- **CatBoost:** Excellent for small tabular datasets
- **XGBoost/LightGBM:** Strong overall performers
- **CNNs:** Best for satellite imagery (but complex)
- **Traditional methods:** Limited accuracy

Geographic Focus

- **Most studies:** US, Europe, China
- **Saudi Arabia:** Limited systematic studies
- **Opportunity identified:** Regional application gap

Methodology Trends

Move toward readily available data with balance between accuracy and practicality