

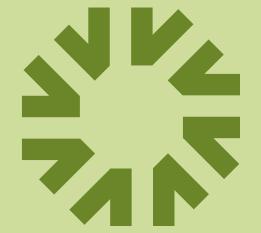


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IMPROVING GENERALIZATION OF DEEP LEARNING MODELS FOR PLANT LEAF DISEASE DETECTION

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Seminar in Machine Learning
Dr. Yehudit Aperstein



RESEARCH QUESTION

How can we achieve robust, high-accuracy leaf-disease classification on real-world (“in-the-wild”) images with noise, variable lighting, and complex backgrounds?

BACKGROUND OF THE STUDY

Why Plant Disease Detection Matters

- Plant diseases cause significant global yield losses, directly affecting food security
- Early detection enables timely treatment, reducing chemical overuse
- Manual inspection is:
 - Time-consuming
 - Expertise-dependent
 - Not scalable



Why Deep Learning?

- CNNs outperform classical vision methods (Mohanty et al., 2016)
- Modern architectures generalize well on controlled datasets
- Generalization to real-world conditions remains challenging

AGENDA OVERVIEW

- 01 Background of the study
- 02 Problem Statement
- 03 Framework
- 04 Methodology

- 05 Qualitative
- 06 Quantitative
- 07 Proposed Timeline
- 08 Analysis

PROBLEM STATEMENT

We're studying the market for a new product, analyzing consumer trends and competition. Our goal is to identify opportunities and challenges, gain valuable insights, and position the product for success.



Scope of the Study

Our study aims to pinpoint challenges and opportunities, assess feasibility, and offer strategic insights.



Relevance of the Study

Understanding its market implications is crucial for businesses aiming to stay competitive and meet evolving customer needs.



Research Question

How can the new product effectively address the market needs, leverage market trends, and differentiate itself in the competitive landscape?

FRAMEWORK

Overview

- Innovation Adoption Theory
- Market Segmentation Theory
- Product Differentiation Theory



Proponents



Aaron Loeb
Innovation Adoption
Theory Maker



Daniel Gallego
Market Segmentation
Theory Maker



Reese Miller
Product Differentiation
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References

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