# Abstract

A widespread global health concern among women is the incidence of the second most leading cause of fatality which is breast cancer. Predicting the occurrence of breast cancer based on the risk factors will pave the way to an early diagnosis and an efficient treatment in a quicker time.

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# 1. Background

Animal vocalizations and natural soundscapes are fascinating objects of study and contain

valuable evidence about animal behaviors, populations and ecosystems. Acoustic insect

recognition can add new insights that are complementary to traditional or camera-based

surveillance. Many important insect groups make species-specific sounds and sound

classification could be a great tool to improve and accelerate specimen identification which

helps to monitor biodiversity and species distribution. Here are hundreds of thousands of

insect species, making their identification an extremely challenging task. Putting into

perspective, in the Netherlands alone, 40% of total biodiversity is estimated to consist of

insects, whereas mammals and plants are just 5% and 8%, respectively.

# 2. Problem Statement OR Related Research OR Related Work

# 3. Research Questions (If any)

The following research questions are suggested for each of the research objective as highlighted as follows.

# 4. Aim and Objectives

The main aim of this research is to develop and evaluate an effective insect audio classification using CNN.

The research objectives are formulated based on the aim of this study which are as follows:

* Train the CNN to learn discriminative features directly from the spectrograms or other audio representations. Experiment with various kernel sizes and network depths to capture both short-term and long-term audio patterns.
* Investigate the potential of transfer learning by fine-tuning a pre-trained CNN (e.g., from image classification tasks) on the insect audio dataset. Assess how this strategy improves convergence speed and classification accuracy.
* Analyze the learned features with the help of LEAF Frontend within the CNN to gain insights into what audio characteristics contribute to accurate classification. Visualize filters and activations to better understand the CNN's decision-making process.

# 5. Significance of the Study

# 6. Scope of the Study

# 7. Research Methodology

Methodology deployed involves key processes such as the selection of target data, pre-processing the chosen data, transforming the data into a structured and comprehensible format, balancing the dataset, implementing supervised learning techniques and evaluating the machine learning performance using evaluation measures. These steps …………………………..

# 8. Requirements Resources

# 9. Research Plan

# References

**Refer: Harvard Referencing Guide**