

AI-Driven Thermal Imaging: A Comprehensive Web-Based Tool for Non-Invasive Medical Diagnostics

Publisher: IEEE

Cite This

PDF

Aniruddha Ghosh ; Sayan Snigdha Pal ; Sumedha Das ; Spandan Bhattacharya ; Arijit Bhattacharya ; Nilanjana De All Authors

31
Full
Text Views



Abstract

Document Sections

- I. Introduction
- II. Literature Review
- III. Methodology
- IV. Results and Analysis
- V. Future scope and conclusion

Authors

Figures

References

Keywords

Metrics

More Like This

Abstract:

Thermography is an innovative technique that creates a heatmap of different portions of the human body by using infrared (IR) radiation where color scales vary for various temperature regions. This work's scope aims to extend thermal imaging applications with machine learning algorithms in conjunction with Azure API services to analyze thermal images and return a preliminary diagnosis. The project consists of generating heatmaps for better visualization results, analyzing them through image processing techniques, and feeding the information to Azure's Custom Vision API to detect anomalies and classify health conditions and finally producing a proper report. This research allows individuals and healthcare professionals to have a quick, non-invasive diagnostic tool that empowers health monitoring and preventive care. It combines the capabilities of contemporary technologies with uses directed toward health practice, leading to inimical patient outcomes and true practices.

Published in: 2025 3rd International Conference on Intelligent Systems, Advanced Computing and Communication (ISACC)

Date of Conference: 27-28 February 2025

DOI: 10.1109/ISACC65211.2025.10969309

Date Added to IEEE Xplore: 22 April 2025

Publisher: IEEE

► ISBN Information:

Conference Location: Silchar, India

I. Introduction

Medical diagnostics has undergone tremendous changes over the past few decades with advanced imaging technologies. Two such newly developed imaging technologies are thermal imaging termed thermography, that does not require touch with a high level of detection of temperature variations throughout the human body. Thermography reflects the surface temperature of objects, and hence the term 'infrared radiation' was invented, which in turn can expose issues that would otherwise not have been diagnosed from other forms of conventional diagnostics. This has made the system increasingly popular in various medical applications, which include detecting inflammations, vascular disorders, and even the early stages of cancers [1]. The intent of this proposition is to make a comprehensive thermal image analysis system that integrates cutting-edge machine learning techniques with cloud-based services, especially Microsoft Azure. The aim here is to provide a means of efficient thermal image analysis to generate actionable health insights. Thermal images would be processed in the system, converting the thermal patterns to heatmaps and processing these heatmaps using deep learning models to be able to identify potential anomalies or health conditions. The project will be enriched by integrating into the Custom Vision API of Azure [2] and Health Insights in which it includes a framework for performing predictive analytics in a proficient manner and providing personalized health reporting. The innovative solution aims to assist the individual and the healthcare practitioner in performing accurate and

Sign in to Continue Reading

Authors

Aniruddha Ghosh

Computer Science and Engineering(Artificial Intelligence and Machine Learning) Institute of Engineering & Management, Kolkata, University of Engineering and Management Kolkata, West Bengal, India

Sayan Snigdha Pal

Computer Science and Engineering(Artificial Intelligence and Machine Learning) Institute of Engineering & Management, Kolkata, University of Engineering and Management Kolkata, West Bengal, India



- Sumedha Das

Computer Science and Engineering(Artificial Intelligence and Machine Learning) Institute of Engineering & Management, Kolkata, University of Engineering and Management Kolkata, West Bengal, India
- Spandan Bhattacharya

Computer Science and Engineering(Artificial Intelligence and Machine Learning) Institute of Engineering & Management, Kolkata, University of Engineering and Management Kolkata, West Bengal, India
- Arijit Bhattacharya

Computer Science and Engineering(Artificial Intelligence and Machine Learning) Institute of Engineering & Management, Kolkata, University of Engineering and Management Kolkata, West Bengal, India
- Nilanjana De

Computer Science and Engineering(Artificial Intelligence and Machine Learning) Institute of Engineering & Management, Kolkata, University of Engineering and Management Kolkata, West Bengal, India
- Sudipta Sahana

Computer Science and Engineering(Artificial Intelligence and Machine Learning) Institute of Engineering & Management, Kolkata, University of Engineering and Management Kolkata, West Bengal, India

Figures	▼
References	▼
Keywords	▼
Metrics	▼

[Back to Results](#)

Need
Full-Text

access to IEEE *Xplore*
for your organization?

CONTACT IEEE TO SUBSCRIBE >

IEEE Personal Account

CHANGE USERNAME/PASSWORD

Purchase Details

PAYMENT OPTIONS

VIEW PURCHASED DOCUMENTS

Profile Information

COMMUNICATIONS PREFERENCES

PROFESSION AND EDUCATION

TECHNICAL INTERESTS

Need Help?

US & CANADA: +1 800 678 4333

WORLDWIDE: +1 732 981 0060

CONTACT & SUPPORT

Follow

f

@

in

▶

✕

About IEEE *Xplore* | [Contact Us](#) | [Help](#) | [Accessibility](#) | [Terms of Use](#) | [Nondiscrimination Policy](#) | [IEEE Ethics Reporting](#) | [Sitemap](#) | [IEEE Privacy Policy](#)

A public charity, IEEE is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity.

© Copyright 2025 IEEE - All rights reserved, including rights for text and data mining and training of artificial intelligence and similar technologies.