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Result Paper On Image or Video Metadata Using AI and Image Processing

Prof. Y. L. Tonape[1], Mr. Shubham T Jagdale[2], Mr. Rohit K Mane[2], Mr. Kiran J Gosavi[2], Mr. Aniket G Kumbhar[2]

*[1]Guide, Department of Computer, SBPCOE Indapur, Maharashtra, India

[2]B E Computer Student, Department of Computer, SBPCOE Indapur, Maharashtra, India

ABSTRACT

In the context of e-learning standards, algorithms capable of processing semi-structured documents in plain text are commonly used for automatic metadata extraction and generation. Given that much of the information available on the web today is unstructured and often in the form of multimedia files, there is a need for more generalized approaches. Our proposed automatic metadata generation procedure aims to label specific unstructured data (such as video lectures) with metadata that aligns with the SCORM reference model. After pre-processing, we evaluate three different summarization algorithms to create synthetic descriptions of video content, covering both the Description and Title aspects. Notably, the Description field of videos demonstrates good agreement with the true lesson abstracts authored by human experts.

Keywords: Artificial Intelligence, Image Processing, Video Analysis, Feature and data Extraction, Metadata Object Detection.

I. INTRODUCTION

The 'Image and Video Metadata' project aims to create a user-friendly software tool for efficiently extracting and analysing metadata from image and video files. The key objective is to provide an intuitive interface that allows users to select media files and obtain detailed information about their content. The project involves extracting metadata from various media formats, including common image types like JPEG and PNG, as well as popular video formats such as MP4 and AVI. Additionally, the project covers interpreting this metadata, including attributes like image resolution, format, creation date, camera settings, and geolocation data for images. For videos, it includes details such as frame dimensions, upload date, view count, comment count, and other relevant information for YouTube videos."

"The Image and Video Metadata project serves as a versatile software solution, enabling users to extract, analyze, and visualize metadata from image and video files. By leveraging Python libraries such as Pillow (for images) and OpenCV (for videos), this project empowers users with valuable insights from their media assets. The user-friendly graphical interface allows users to select an image or video file, after which the program deciphers and organizes the embedded metadata. For images, this includes attributes like resolution, format, creation date, camera model, and GPS data (if available). Video metadata encompasses details such as frame dimensions,

upload date, view count, like count, and comments for YouTube videos. Overall, this project provides a convenient way to explore the hidden information within media files, benefiting photography enthusiasts, content creators, and various other applications.

II. LITERATURE SURVEY

In their 2023 paper titled 'High Performance Artificial Intelligence Recommendation of Quality Research Papers Using an Effective Collaborative Approach,' Vinoth Kumar Venkatesan, Mahesh Thyluru Ramakrishna, Anato-liyBatyuk, And-rii Barna, and Bohdana Havrysh address the problem of recommending relevant, high-quality research papers to researchers based on paper-citation relationships. They propose the RPRSCA technique, which leverages latent linkages between a research paper, its references, and citations from uncertain systems. Future work in this area could focus on improving the methodology, particularly the metrics used for information retrieval systems, such as accuracy, recall, and F1 measurement."[1].

"In their 2021 paper titled 'Video Processing Using Deep Learning Techniques: A Systematic Literature Review,' Vijeta Sharma, Ma-njiri Gupta, Ajai Kumar, and Deepti Mishra address the application of deep learning techniques to video processing. Their methodology focuses on video classification, analysis, and recognition. These techniques enhance various aspects of video understanding, including video classification, analysis, action recognition, and pose recognition. Looking ahead, the authors suggest future research directions related to specific data challenges, such as threat identification, multi-person identification, multi-object tracking, and scene labeling."[2].

"In their 2021 paper titled 'Automated Metadata Annotation: What Is Not Possible with Machine Learning,' Hans Brandhorst, Joseph Busch, Dr. Joaquim More Lopez, Marjorie Hlava, Dr. Mariacristina, and Dr. Mingfang Wu address the challenge of automated metadata annotation. They emphasize that the effectiveness of such annotation heavily relies on the quality of the training dataset and the domain-specific rules available. Understanding the data content that a pre-trained machine learning algorithm has been exposed to is crucial for recognizing its limitations and potential biases. Notably, various software and technology companies offer AI solutions, but each has distinct strengths and weaknesses in the technical aspects they address." [3].

"In their 2021 paper titled 'Artificial Intelligence in Information Systems Research: A Systematic Literature Review and Research Agenda,' Christopher Collins, Denis Dennehy, Kieran Conboy, and Patrick Mikalef explore the multifaceted role of AI. They highlight that AI is applied to various domains, including perceiving, reasoning, learning, interacting with the environment, problem-solving, decision-making, and even demonstrating creativity. Looking ahead, the authors emphasize the need for identifying the current reported business value and contributions of AI, as well as investigating practical implications for its use." [4].

"In their 2020 case study titled 'Integrating Artificial Intelligence Metadata within Paramount's Digital Asset Management System,' Dony West, Caitlin Denny, and Rebe-cca Ruud explore the integration of AI-based metadata tools. The problem addressed is the enhancement of archivist workflows using AI techniques such as face detection, object detection, and text detection. These tools assist archivists in locating relevant content within the digital asset management system. For instance, AI can identify images of specific sets, search for objects based on user requests, or even suggest suitable artwork for home decor. However, it's important to note that these AI tools are not entirely accurate and should complement, rather than replace, human interaction. The study emphasizes the need for AI service providers and software companies to actively seek user feedback to improve their glossaries and datasets.[5]. The detailed survey given in paper [9]

III.PROPOSED SYSTEM

A. Problem Statement

In today's digital age, the vast amount of image and video content being created and shared online has made it increasingly challenging to manage and organize this media effectively. Traditional methods of manually tagging and categorizing images and videos are time consuming and error-prone, leading to inefficient data management and retrieval. This project aims to address this problem by leveraging the power of artificial intelligence (AI) to automatically extract and analyse metadata from images and videos.

B. Software Requirement

- Operating System – Windows
- Front End - HTML, CSS
- Language – Python
- Database-MySQL
- IDE –Spyder, jupyter

C. Hardware Requirement

- Processor - Intel i5/i7
- Speed - 3.1 GHz
- RAM - 4 GB(min)
- Hard Disk - 20 GB
- Key Board - Standard Windows Keyboard
- Mouse - Two or Three Button Mous
- Monitor – SVGA

IV. ALGORITHM/WORKFLOW OF SYSTEM

Using EXIF data we can extract the metadata from images and videos. Exif metadata, commonly generated by cameras and other capture devices, contains technical details related to an image's capture process. This information encompasses exposure settings, capture timestamp, GPS coordinates, and camera model."
organizing and managing digital assets. Metadata is descriptive information that provides context about the content of an image or video. It can include information such as the date and time the image was captured, the location, camera settings, and other details.

- Metadata schema.
- Metadata management software.
- Metadata storage.
- Metadata extraction.
- Metadata validation
- Metadata displayed

Step-by-step execution
Step 1. Start Register then login

Step 2. Load an image or video file
Step 3. Read the image or video file using Open CV Library
Step 4. then extract the properties of image or video
Step 5. Displaying the extracted metadata Of selected video or image file.

V. RESULTS

A. Registration Process

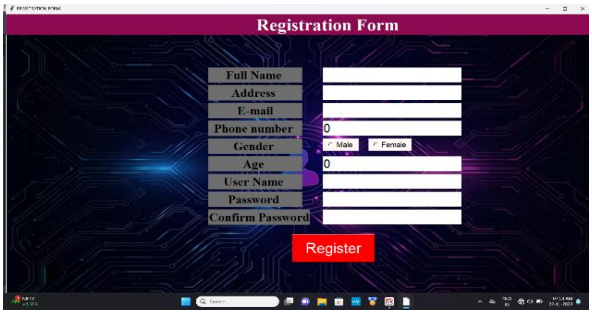

Figure 1: Registration Process

It collects user information, including Full Name, Address, Username, Email, Phone Number, Gender, Age, Password, and Confirm Password.

B. Login Process

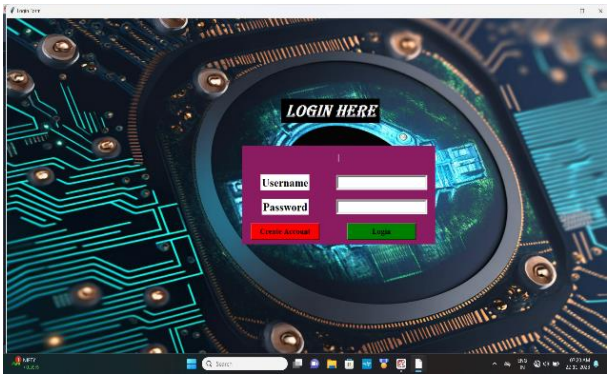

Figure 2: Login Process

It checks the entered credentials against the data stored in the evaluation.db database.

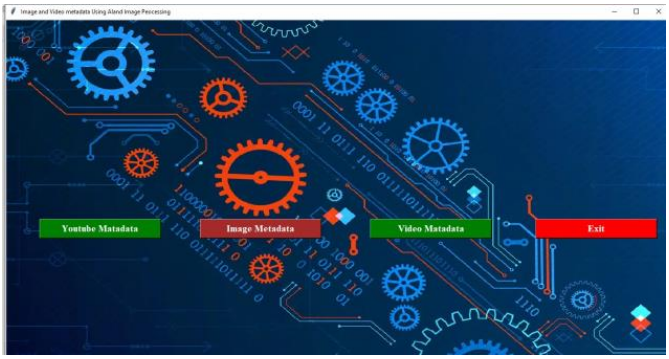

Figure 3:

Figure 4:

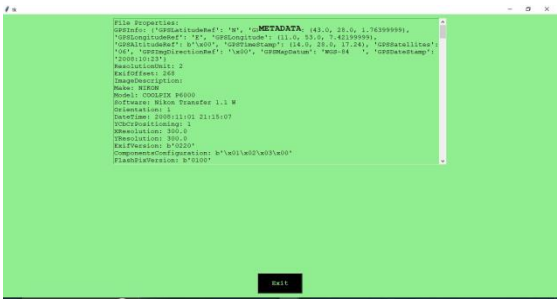

Figure 5:

Metadata includes general file properties, EXIF data, and additional image-related information.
It displays the extracted metadata in a Tkinter window with a scrollable text widget.

C. Video Metadata Extraction

Figure 6:

Figure 7:

It displays the extracted metadata in a Tkinter window with a scrollable text widget.

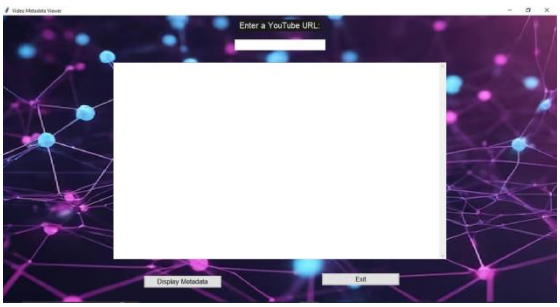

Figure 8:

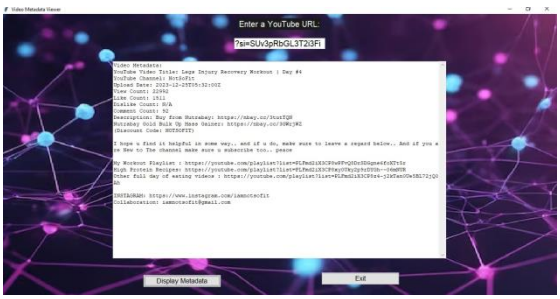

Figure 9:

The user inputs a YouTube URL, and the script fetches information similar to the final.py script.

VI. CONCLUSION

The Image and Video Metadata project has effectively delivered a user-friendly solution for extracting metadata from image and video files. Its advantages include an intuitive interface, support for batch processing, customization options, secure data handling, and compatibility across different environments. Users can efficiently organize and analyse their media files, benefiting content creators, geotagging enthusiasts, developers, and educational users. However, it's important to note that the project has limitations related to online video retrieval, file format sensitivity, and performance with large datasets.

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