



(10) Publication No: **IN202511130485 A1**
(22) Date of Filing: 23-12-2025

(43) Publication Date: 30-01-2026
Journal No: 05/2026

(19) Intellectual Property Office, India

(12) INDIAN PATENT APPLICATION

(54) Title: **Rezio ai media optimization saas**

(51) International Classification: G06T 3/40, H04N 21/2343, H04N 21/4402, H04N 21/845 H04N 21/81 (21) Application No: 202511130485 (31) Priority Document No: -- (32) Priority Date: -- (86) International Application No: -- Filing Date: -- (87) International Publication No: -- (61) Patent of Addition to Application No: -- Filing Date: -- (62) Divisional to Application No: -- Filing Date: --	(71) Name of Applicant(s): Dronacharya College Of Engineering, (72) Name of Inventor(s): 1. Aayush Yadav 2. Prof. Vimmi Malhotra 3. Prof. Ashima Mehta
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(57) Abstract:

Creators and businesses increasingly struggle to prepare media for multiple platforms, each requiring different aspect ratios and compression standards. As the demand for multimedia content across social media and online platforms grows, creators and businesses face increasing challenges in optimizing media for different formats. Manual editing is time-consuming and inconsistent. Traditional media editing is time-consuming, error-prone, and often lacks precision, especially for non-technical users. This project introduces a cloud-based AI media-optimization SaaS that automates resizing, cropping, and compression for images and videos using Cloudinary's intelligent transformation pipeline to ensure optimal image and video outputs while maintaining high visual quality. With a modern, intuitive UI, secure authentication, the system provides one-click presets for Instagram, Facebook, YouTube, and other formats, ensuring subject-aware framing and high-quality, web-optimized outputs. The platform streamlines media preparation, significantly reduces manual labor, and provides a fast, seamless experience for users of all skill levels. Built with secure authentication and a modern dashboard, the platform streamlines media preparation, reduces manual effort, and delivers fast, production-ready results for users at any skill level. Additionally, the system is designed to handle scalability for businesses and marketing teams, making it a valuable tool for content creators at every stage of production.

Problem Statements

- Creators and businesses must manually edit media for every platform, each with different aspect ratios, resolutions, and compression requirements, resulting in a time-consuming and repetitive workflow.
- Existing media tools are fragmented, requiring separate apps or manual steps for cropping, resizing, background filling, and video compression, leading to inconsistent results.
- Non-technical users struggle with remembering platform specifications (e.g., Instagram Reels, YouTube thumbnails, and Facebook covers), causing improper formatting and reduced content quality.
- Manual cropping often cuts out key subjects, as traditional tools lack content-aware framing or AI-based detection, reducing professional appearance.
- Video compression is complex, and poor optimization leads to large file sizes, slow loading times, and reduced engagement on

social platforms. •Current solutions lack seamless automation and integration, forcing users to repeat the same editing steps for each media asset. •No unified SaaS platform exists that provides authentication, user dashboards, history tracking, and automated image/video optimization in a single workflow. •Scaling media tasks for creators or marketing teams is difficult without automated multi-format output generation.

TITLE: Rezio AI Media Optimization SaaS

Abstract

Creators and businesses increasingly struggle to prepare media for multiple platforms, each requiring different aspect ratios and compression standards. As the demand for multimedia content across social media and online platforms grows, creators and businesses face increasing challenges in optimizing media for different formats. Manual editing is time-consuming and inconsistent. Traditional media editing is time-consuming, error-prone, and often lacks precision, especially for non-technical users. This project introduces a cloud-based AI media-optimization SaaS that automates resizing, cropping, and compression for images and videos using Cloudinary's intelligent transformation pipeline to ensure optimal image and video outputs while maintaining high visual quality. With a modern, intuitive UI, secure authentication, the system provides one-click presets for Instagram, Facebook, YouTube, and other formats, ensuring subject-aware framing and high-quality, web-optimized outputs. The platform streamlines media preparation, significantly reduces manual labor, and provides a fast, seamless experience for users of all skill levels. Built with secure authentication and a modern dashboard, the platform streamlines media preparation, reduces manual effort, and delivers fast, production-ready results for users at any skill level. Additionally, the system is designed to handle scalability for businesses and marketing teams, making it a valuable tool for content creators at every stage of production.

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- Scaling media tasks for creators or marketing teams is difficult without automated multi-format output generation.

Overview:

This project is a production-ready AI media-optimization SaaS application. It allows users to upload images and videos and automatically optimizes them for multiple platforms such as Instagram, Facebook, YouTube, and more. The system uses Cloudinary's AI-driven transformation pipeline to resize, crop, extend backgrounds, and compress media with high visual quality. The platform is built as a complete SaaS product featuring authentication, a polished UI, and a scalable backend.

The Core features of this project include:

- **Image Optimization:**

- **Intelligent Content-Aware Cropping:**

In addition to basic resizing, the system intelligently identifies the key subject of the image using AI and centres it during cropping. This ensures that no important elements of the image are cut off, even during extreme resizing for different formats.

- **Adaptive Background Extension:**

For images with smaller aspect ratios (e.g., portrait images for landscape formats), the platform can extend backgrounds using AI to fill the frame, ensuring that no blank spaces or unattractive borders remain.

- **Compression with Visual Quality Retention:**

The image compression algorithms are designed to optimize the quality-to-size ratio without compromising visual appeal. This ensures the media loads quickly without appearing pixelated, even at reduced file sizes.

- **Video Optimization:**

- **Multi-Resolution Video Compression:**

The platform supports multi-resolution video compression, ensuring that users can generate optimized video files for various devices, from desktop monitors to mobile screens. By detecting the optimal resolution for each platform, it maintains visual quality while reducing unnecessary data usage.

- **Automatic Video Trimming for Specific Platform Requirements:**

The system not only compresses but can also trim videos to match specific platform guidelines (e.g., Instagram Stories max length of 15 seconds). This ensures that users don't have to manually edit videos, saving valuable time.

- **One-Click Presets:**

- **Customizable Preset Creation:**

Users can create their own custom presets tailored to their unique platform requirements, such as branded image sizes or specific video formatting guidelines. These presets can be saved and reused for future projects, ensuring consistency across campaigns.

- **Real-Time Preview and Adjustment:**

Before finalizing the optimization, users can preview the media in real-time, making minor adjustments if necessary. This provides an extra layer of control over the output, ensuring the result is exactly as desired.

SaaS Architecture & User Experience:

- **Backend Infrastructure:**

The system is built on a cloud-native architecture, utilizing scalable services to handle varying media processing loads. The backend leverages micro services and server less computing to ensure elasticity, allowing the platform to handle sudden spikes in media uploads without downtime.

- **Database Architecture:**

A NoSQL database is used for efficient handling of user data, media history, and optimized assets. The database supports real-time syncing across multiple devices and ensures seamless user experience, even in high-traffic situations.

- **Data Security & Privacy:**

For secure authentication and user data management, the platform uses Clerk, which integrates securely with OAuth and two-factor authentication (2FA). All media files are stored and transmitted using encryption (AES-256) to ensure the privacy and security of user content. This is especially critical for businesses and marketing teams handling sensitive media assets.

- **Scalability for Teams and Enterprises:**

The platform supports team-based workflows, allowing multiple users within a company to collaborate on media optimization projects. Team members can share assets, assign tasks, and track progress via the personal dashboards, all while ensuring data privacy and security.

Authentication:

- Uses Clerk for secure login, signup, and session handling.
- Every user gets a personal dashboard with media history.

Dashboard Workflow:

- Users log in, upload media, select optimization presets, and preview/ download results.
- Clean and intuitive UI designed for non-technical creators and marketers.

Production-Ready Codebase:

- Cloud-native configuration with environment variables.
- Cloudinary pipelines for scalable media processing.
- Suitable for deployment as a real SaaS product or portfolio demonstration.

Claims:

- i. The system provides an AI-powered media-optimization pipeline capable of transforming images and videos into multiple platform- specific formats automatically.
- ii. The invention integrates intelligent, content-aware cropping that preserves key subjects across all aspect ratios without user intervention.
- iii. The system incorporates Cloudinary's transformation engine to resize, compress, extend backgrounds, and optimize media using a unified automation workflow.
- iv. The invention delivers real-time processing of images and videos with high compression efficiency while maintaining visual quality.
- v. The system includes one-click preset generation for Instagram, Facebook, YouTube, and marketing formats, enabling non- technical users to produce platform-ready assets.
- vi. The platform provides a secure SaaS environment through role-based authentication, session management, and user-specific media history.
- vii. The invention supports automated video compression pipelines optimized for web and mobile performance with reduced bandwidth requirements.
- viii. The system introduces a centralized dashboard enabling users to upload, preview, download, and manage optimized media assets efficiently.
- ix. The architecture is fully cloud-native and scalable, supporting high-volume media uploads and parallel processing with minimal latency.
- x. The invention features modular preset creation, allowing businesses or creators to define custom output dimensions and optimization rules.
- xi. The system ensures compatibility with multiple media formats, including JPEG, PNG, WebP, MP4, and MOV, without requiring additional plugins.
- xii. The platform provides automated background extension and smart-fill generation to maintain visual consistency during aspect-ratio transformations.
- xiii. The system enables creators to eliminate manual editing time by automating repetitive tasks such as cropping, resizing, compression, and exporting.
- xiv. The invention provides a downloadable multi-asset output package, bundling all optimized formats in a single export operation.
- xv. The architecture ensures high reliability and fault tolerance through cloud-based storage, API rate-handling, and asynchronous processing queues

DRAWINGS

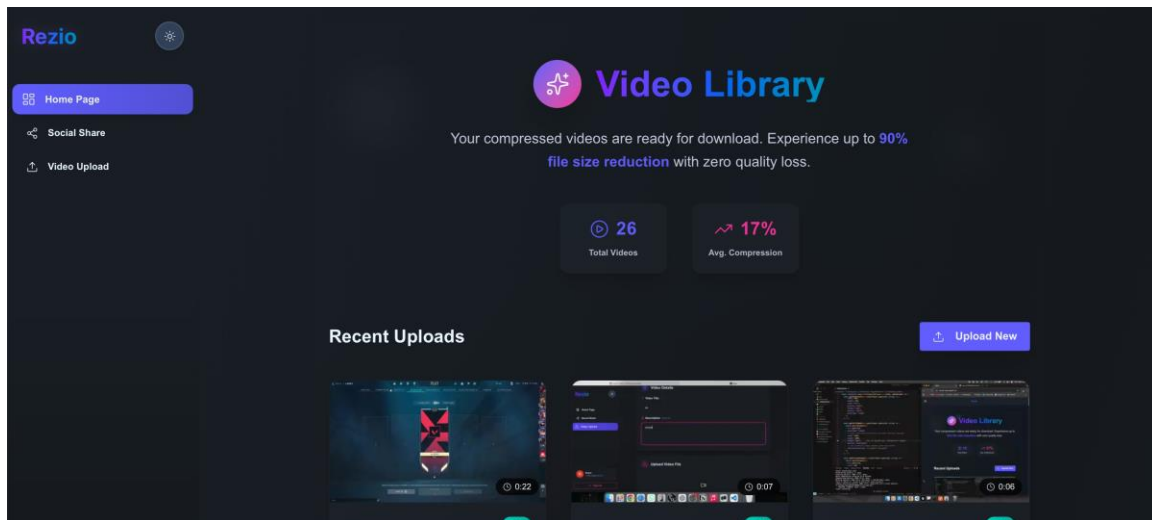


Figure 1: Web page of the website

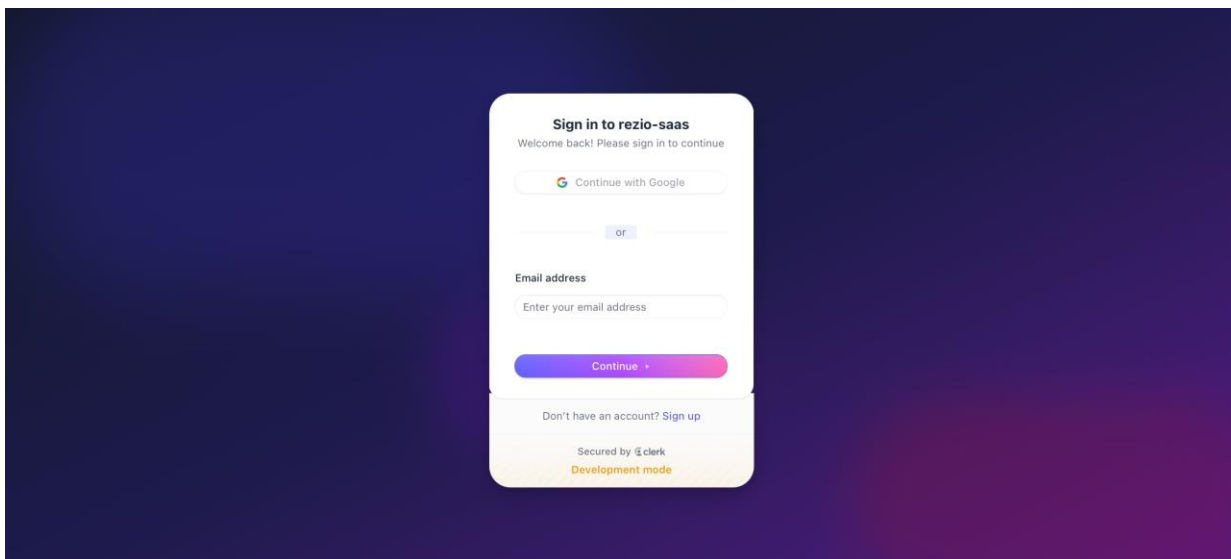


Figure 2: Sign-in page for the users

Short Showcase Paragraph:

Rezio SaaS is an AI-powered media optimization platform that transforms raw images and videos into ready-to-publish content. Users upload their media, and the app automatically generates optimized formats using Cloudinary's intelligent AI transformations. Built with full authentication, a clean dashboard, and production-grade architecture, it is designed for creators and businesses who need high-quality media instantly.

