

Content Based Image Search Engine

Tech Mahindra's content-based image retrieval (CBIR) for laminates is an artificial intelligence (AI) based laminate image enhancement, search, and retrieval engine. This mobile based solution matches the visual content of a given input image against the laminate images archived in the repository and retrieves those closely matched laminates as a catalogue for users to select to place an order.

The solution can be applied to, for instance, companies that manufacture and distribute high pressure laminate, quartz, solid surface, coordinated TFL, and edge banding, continuously need to redefine decorative surfaces through improved performance and award-winning designs.

OUR SOLUTION

Tech Mahindra's solution demonstrates the use of an AI based approach to search, match, and display laminates similar to existing laminates in front of the customer. CBIR interfaces with end-users through a pre-existing mobile application. This solution leverages Tensorflow library for AI model development.

Features of the Solution

- **Image Enhancement:** DeNoise model is used to clean the laminate image captured using a mobile app and provide sharper and better image for feature extraction. Auto Encoder and 12-layer ResidualCNN model is considered to minimize the composite loss function
- **CBIR:** Auto Encoder model to extract latent features (pattern, colour, texture) from the enhanced laminate image received. Based on distant function, match these extracted features with features of laminate images present in the repository
- **Provides recommendation:** As an outcome of the model, multiple laminate options/images which are similar to the input laminate are provided as a recommendation to the end user

Solution Technology

- Tensorflow/Keras based AI Models
- Latent image encoding techniques for image matching
- Specialised indexing techniques for quick and efficient retrieval of search data

KEY CHALLENGES

Current system uses static filtering and browsing techniques based on predefined categories that leads to following issues:

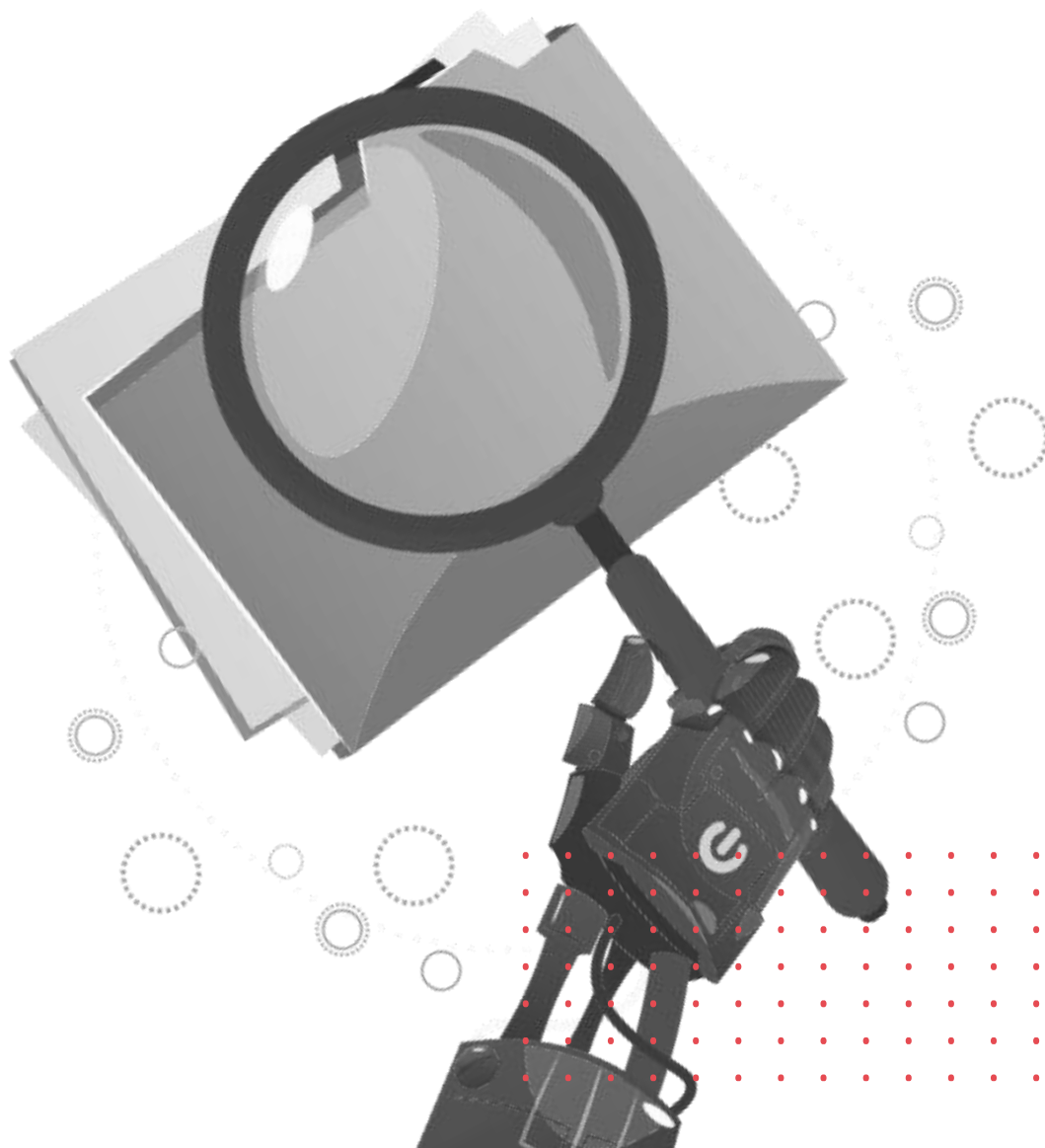
- Manual and time-consuming process to identify laminates from large laminate repository
- Poor quality of laminate images captured by mobile camera reduces search accuracy
- Functionalities of the pre-existing mobile app require enhancement and support similarity check function
- Large variety (colour, texture, pattern) of laminates adding to the complexity

BENEFITS

- 92% hit ratio for identifying correct laminate images based on the given input
- Reduced effort and time frame to browse through the large laminate catalogue and provide options to the customer
- AI powered mobile app and improved customer experience by multi-fold

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