

ANNEXURE - I		
STUDENTS PROJECT ROAD MAP		
NAME OF THE STUDENTS		REGISTER NUMBER
DEVADARSHINI M		211422243055
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NAME OF THE SUPERVISOR: Dr. M.S.MAHARAJAN		
DEPARTMENT: ARTIFICIAL INTELLIGENCE AND DATA SCIENCE		
1	TITLE OF THE PROJECT	Deep Learning Based Emotion-Driven Music Recommendation System
2	RATIONALE (why the topic is important today in 3 sentences in bullet points)	<ul style="list-style-type: none"> <li>• People struggle to find music that matches their current emotional state in real time.</li> <li>• Traditional recommendation systems rely on user preferences or history, not live emotion.</li> <li>• AI-based emotion recognition can enhance user engagement through mood-based personalization</li> </ul>
3	LITERATURE SURVEY (Top 5 articles utilized for finding the research gap and their SCOPUS impact factor)	<ul style="list-style-type: none"> <li>• H. Zhang et al., "Face Emotion Recognition Using CNN", IEEE Access, IF: 3.36</li> </ul>

		<ul style="list-style-type: none"> <li>• D. Kim et al., "Music Recommendation Using K-Means Clustering", IF: 2.67</li> <li>• D. Ayata et al., "Emotion Detection via Wearable Sensors", IEEE Trans. on Consumer Electronics, IF: 3.11</li> <li>• W. C. Chiang et al., "Hierarchical SVM for Music Emotion Recognition", IF: 1.98</li> <li>• F. Fessahaye et al., "T-RECSYS: Hybrid Deep Learning Music Recommender", IF: 4.21</li> </ul>
4	<p>RESEARCH GAP</p> <p>(Maximum 3 sentences in bullet Points)</p>	<ul style="list-style-type: none"> <li>• Existing systems don't combine real-time facial emotion recognition with music mapping.</li> <li>• Lack of user-centric dynamic song suggestions based on current mood.</li> <li>• Limited implementation using deep learning architectures like ResNet50V2 for emotion-based music systems.</li> </ul>
5	<p>BRIDGING THE GAP</p> <p>(Maximum 4 sentences in bullet Points)</p>	<ul style="list-style-type: none"> <li>• Facial emotion is detected using deep learning models (CNN &amp; ResNet50V2).</li> <li>• Real-time emotion analysis provides immediate music suggestions.</li> </ul>

		<ul style="list-style-type: none"> <li>• Combines AI, Computer Vision, and emotion mapping to recommend relevant songs.</li> <li>• Provides a dynamic, responsive alternative to traditional static music systems.</li> </ul>
6	<p>NOVELTY</p> <p>(Maximum 3 sentences in bullet Points)</p>	<ul style="list-style-type: none"> <li>• Integrates facial expression analysis with music genre mapping.</li> <li>• Uses deep learning (ResNet50V2) for high-accuracy emotion recognition.</li> <li>• Real-time emotion detection enables automatic mood-based song recommendation.</li> </ul>
7	<p>OBJECTIVES</p> <p>(Maximum 5 sentences in bullet Points)</p>	<ul style="list-style-type: none"> <li>• Develop a system that detects facial emotions using deep learning models.</li> <li>• Classify emotions into predefined categories like Happy, Sad, Angry, etc.</li> <li>• Map each emotion to suitable music genres using a curated dataset.</li> <li>• Enhance user experience through real-time, mood-based music suggestions.</li> </ul>

		<ul style="list-style-type: none"> <li>● Implement and evaluate model performance using accuracy and classification metrics.</li> </ul>
8	<p>PROCESS METHODOLOGY (Maximum 7 sentences in bullet Points)</p>	<ul style="list-style-type: none"> <li>● Acquire image input from webcam or file upload.</li> <li>● Perform preprocessing and face detection using OpenCV and Haar cascades.</li> <li>● Use CNN and ResNet50V2 for emotion classification.</li> <li>● Map detected emotion to music genre using a predefined dictionary.</li> <li>● Display song suggestions from curated mood-based datasets.</li> <li>● Evaluate the system using precision, recall, and F1-score.</li> <li>● Optimize model performance using callbacks and hyperparameter tuning.</li> </ul>
9	<p>SIMULATION METHODOLOGY AND SIMULATION SOFTWARE REQUIREMENT (Maximum 4 sentences in bullet Points)</p>	<ul style="list-style-type: none"> <li>● Model developed in Python using TensorFlow, Keras, and OpenCV.</li> <li>● Training done on FER2013 dataset using CNN and ResNet50V2 architectures.</li> <li>● Data preprocessing and augmentation using ImageDataGenerator.</li> <li>● Evaluation via confusion matrix and classification report.</li> </ul>

10	DELIVERABLES & OUTCOMES (Maximum 4 sentences in bullet Points) (Technology, Prototype, Algorithm, Software, patent, publication, etc)	<ul style="list-style-type: none"> <li>• Deep Learning models for facial emotion recognition.</li> <li>• A working prototype of the music recommendation system.</li> <li>• Dataset integration and emotion-to-genre mapping algorithm.</li> <li>• Journal publication and potential for real-world application.</li> </ul>
11	PROJECT CONTRIBUTION IN REALTIME	<ul style="list-style-type: none"> <li>• Conference Paper: Published in ICONIC PECTEAM 2K25</li> <li>• Indexed in Google Scholar</li> <li>• Lays foundation for further AI-driven human-computer interaction research</li> <li>• Can be expanded for future patent or copyright applications</li> </ul>
11	SUSTAINABLE DEVELOPMENT GOALS MAPPED (Mention the SDG numbers)	SDG 3 , SDG 9 , SDG 11
12	PROGRAMME OUTCOME MAPPING (PO) (Mention the PO numbers)	PO1 , PO2 , PO3 , PO5 , PO6 , PO12
13	TIMELINE	Milestones
	Month 1	Literature survey, Dataset collection, Model planning
	Month 2	Model training, Emotion recognition implementation

	Month 3	Recommendation system integration, Evaluation, Report writing
SUPERVISOR SIGNATURE		