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1. Image Compression using Discrete Cosine Transform (DCT)

- **Description**: Implement image compression algorithms using DCT to reduce image size without significant quality loss.
- **Technologies**: MATLAB Image Processing Toolbox, DCT.

2. Face Recognition using PCA (Principal Component Analysis)

- **Description**: Build a face recognition system using PCA to reduce dimensionality and identify faces in a dataset.
- **Technologies**: MATLAB, PCA, Image Processing Toolbox.

3. Digital Signal Processing (DSP) for Audio Signals

- **Description**: Perform filtering, modulation, and transformation of audio signals using MATLAB's DSP toolbox.
- **Technologies**: MATLAB, DSP Toolbox, Fourier Transform.

4. MATLAB-based ECG Signal Analysis

- **Description**: Analyze ECG signals for diagnosing heart-related issues using feature extraction techniques.
- **Technologies**: MATLAB, Signal Processing Toolbox, Biomedical Signal Processing.

5. Image Edge Detection using Sobel and Canny Filters

- **Description**: Implement Sobel and Canny edge detection techniques to extract edges from images.
- **Technologies**: MATLAB Image Processing Toolbox, Edge Detection.

6. Real-Time Audio Equalizer

- **Description**: Create an audio equalizer that adjusts the frequency response of an audio signal in real time.
- **Technologies**: MATLAB, Audio Processing, Signal Processing Toolbox.

7. MATLAB-based Automatic Number Plate Recognition (ANPR)

- **Description**: Develop an ANPR system that detects and recognizes vehicle number plates from images.
- **Technologies**: MATLAB, Image Processing Toolbox, OCR.

8. MATLAB-based PID Controller Design

- **Description**: Design and simulate a Proportional-Integral-Derivative (PID) controller for various applications.
- **Technologies**: MATLAB Control System Toolbox, PID.

9. Simulink Model of an Electric Vehicle (EV)

- **Description**: Build a simulation of an electric vehicle using MATLAB/Simulink, focusing on energy management and battery dynamics.
- **Technologies**: Simulink, Power Systems, Electric Vehicle Modeling.

10. MATLAB-based Object Tracking in Video

- **Description**: Implement algorithms to track moving objects in a video stream using MATLAB's video processing tools.
- **Technologies**: MATLAB, Video Processing, Kalman Filter.

11. Solar Power System Simulation

- **Description**: Simulate the performance of a solar power system, including the photovoltaic (PV) array, converters, and battery storage.
- **Technologies**: Simulink, MATLAB, Renewable Energy Modeling.

12. MATLAB-based Traffic Light Control System

- **Description**: Design a traffic light controller and simulate its operation at a junction using finite state machines.
- **Technologies**: MATLAB, Simulink, Stateflow.

13. Image Denoising using Wavelet Transforms

- **Description**: Implement wavelet-based image denoising algorithms to remove noise from images.
- **Technologies**: MATLAB, Image Processing, Wavelet Toolbox.

14. MATLAB Simulation of a Power Grid System

- **Description**: Simulate the operation of a power grid with generators, transformers, and load centers.
- **Technologies**: MATLAB, Simulink, Power Systems Toolbox.

15. Fingerprint Recognition System

- **Description**: Develop a fingerprint recognition system using MATLAB for biometric identification.
- **Technologies**: MATLAB, Image Processing, Pattern Recognition.

16. Speech-to-Text Conversion using MATLAB

- **Description**: Implement a speech recognition system to convert spoken words into text using MATLAB's audio processing capabilities.
- **Technologies**: MATLAB, Audio Processing, Signal Processing.

17. Model Predictive Control (MPC) for Industrial Applications

- **Description**: Design and simulate a Model Predictive Controller (MPC) for optimizing industrial processes.
- **Technologies**: MATLAB Control System Toolbox, MPC.

18. Simulink Model for DC Motor Speed Control

- **Description**: Develop a Simulink model to control the speed of a DC motor using different control techniques (PID, fuzzy logic).
- **Technologies**: Simulink, Control Systems, MATLAB.

19. MATLAB-based Lane Detection for Autonomous Vehicles

- **Description**: Implement a lane detection algorithm for autonomous vehicle systems using image processing techniques.
- **Technologies**: MATLAB, Image Processing, Computer Vision.

20. Wireless Communication System Simulation

- **Description**: Simulate the transmission and reception of signals in a wireless communication system using MATLAB.
- **Technologies**: MATLAB, Simulink, Communication Systems Toolbox.

21. MATLAB-based Brain Tumor Detection

- **Description**: Develop a machine learning model using MATLAB for detecting brain tumors from MRI images.
- **Technologies**: MATLAB, Machine Learning, Image Processing.

22. Smart Home Energy Management System Simulation

- **Description**: Simulate a smart home energy management system using MATLAB and optimize energy consumption.
- **Technologies**: MATLAB, Simulink, Renewable Energy, IoT.

23. Fuzzy Logic Controller for Temperature Control

- **Description**: Design a fuzzy logic-based controller to maintain temperature in a room or industrial setting.
- **Technologies**: MATLAB Fuzzy Logic Toolbox, Control Systems.

24. Real-Time Audio Noise Cancellation System

- **Description**: Implement real-time noise cancellation for audio signals using adaptive filters.
- **Technologies**: MATLAB, Audio Processing, Adaptive Filters.

25. Simulink Model of a Wind Energy System

- **Description**: Build a simulation model of a wind energy conversion system and analyze its performance under varying wind conditions.
- **Technologies**: Simulink, Renewable Energy, MATLAB.

26. MATLAB-based Stock Market Prediction using Machine Learning

- **Description**: Develop a machine learning model to predict stock market prices using historical data.
- **Technologies**: MATLAB, Machine Learning, Data Analysis.

27. Speech Emotion Recognition System

- **Description**: Build a system to recognize emotions from speech using machine learning techniques in MATLAB.
- **Technologies**: MATLAB, Audio Processing, Machine Learning.

28. Simulink Model of an HVAC System

- **Description**: Simulate the performance of a Heating, Ventilation, and Air Conditioning (HVAC) system and optimize its energy efficiency.
- **Technologies**: Simulink, MATLAB, HVAC Modeling.

29. Vehicle Number Plate Recognition using MATLAB

- **Description**: Implement a system to detect and recognize vehicle number plates from traffic camera footage.
- **Technologies**: MATLAB, Image Processing, OCR.

30. Simulink Model of a Battery Management System (BMS)

- **Description**: Design and simulate a BMS to manage the charge and discharge cycles of a battery in electric vehicles.
- **Technologies**: Simulink, MATLAB, Electric Vehicle Systems.