WINTER HACKATHON

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Problem statement #6:
Gesture Based Game Controller

Theme: Python

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GESTURE BASED GAME CONTROLLER

Features :

- **Gesture Recognition**: The primary feature of the controller is its ability to recognize gestures like hand movements and finger gestures to control the Tetris blocks.
- **Positional Tracking**: Ensure accurate tracking of the player's hand or body position, allowing precise control over the Tetris pieces' movement.
- **Rotations**: Enable gesture-based rotations for the Tetris pieces. For instance, a specific gesture to rotate the piece 90 degrees clockwise.

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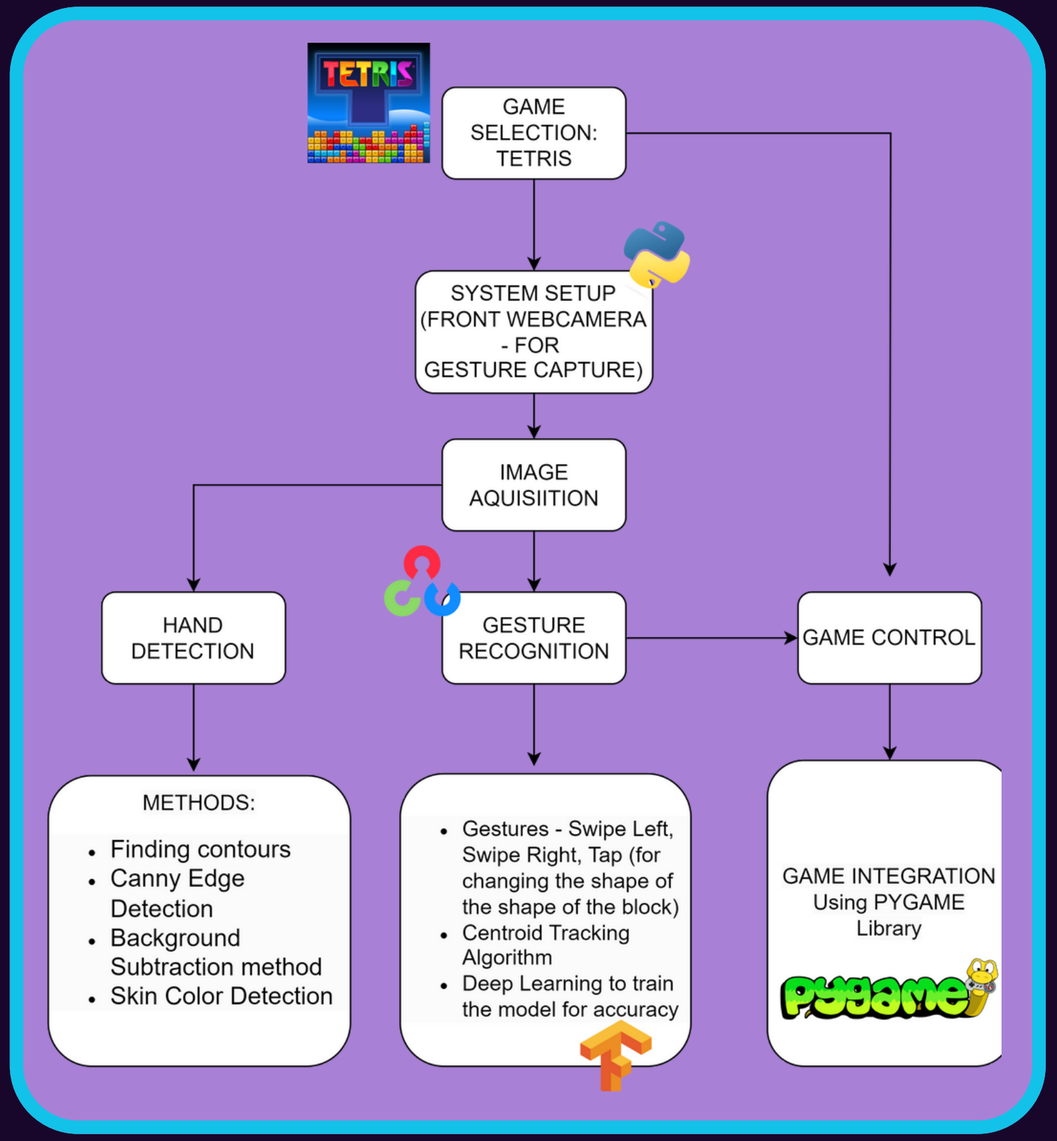
- **Gesture for Dropping**: A distinct gesture to make the Tetris piece drop instantly to the bottom.
- **Pause/Resume Gestures**: Implement multi-hand gestures to pause and resume the game and control the volume and music of the game.

Technology Stacks:

OpenCV Python TensorFlow Pygame

GESTURE BASED GAME CONTROLLER

Methodology:



Approach:

For Hand Detection:

Skin Color Filtering, Haar cascades and Histogram of Oriented Gradients (HOG) , Hand contours extraction from binary images using techniques like edge detection and contour finding.

Mapping Gestures to In-Game Actions:

For instance, a swipe gesture could correspond to character movement, and a specific hand pose might trigger a special ability.

Real-Time Game Looping:

Ensure that both the game loop and gesture recognition are running in real-time to create a seamless gaming experience.

Game-Webcam Integration:

Video Capture: Use OpenCV to capture frames from the webcam feed, Frame Processing: Process each captured video frame, if necessary. Overlaying the Webcam Feed: Overlay the processed video frame on top of the game display using transparency.