

### **Card Detection:**

Detect where the cards are in the image after smoothing, canny edge detection and selecting contours with 4 corners only (approximating contours to the nearest polygon)

### **Card Identification:**

We propose Image Processing Technique Template Matching and Learning based Random Forest approach to identify the card (Suit and Rank) by feeding a vector of image features (pixels) as input.

### **Poker Hand Detection:**

Using a set of predefined rules, we try to identify the hand of a player from the 7 cards (2 Player's Hand + 5 of Dealer's Deck) using basic rules.

### **Limitations Faced:**

1. Strong and Variable Background Noise >> Smoothing
2. Brightness/Contrast dependent Detection >> Gamma Transform(>1)
3. Variable Initial Card Orientation >> Perspective Transform
4. Large Number of Repeated and Useless Contours >> Contour Clustering
5. Limited Data Sample Points >> Data Augmentation to train Random Forest
6. Weak Image Pixel Features >> Use HOG feature descriptors

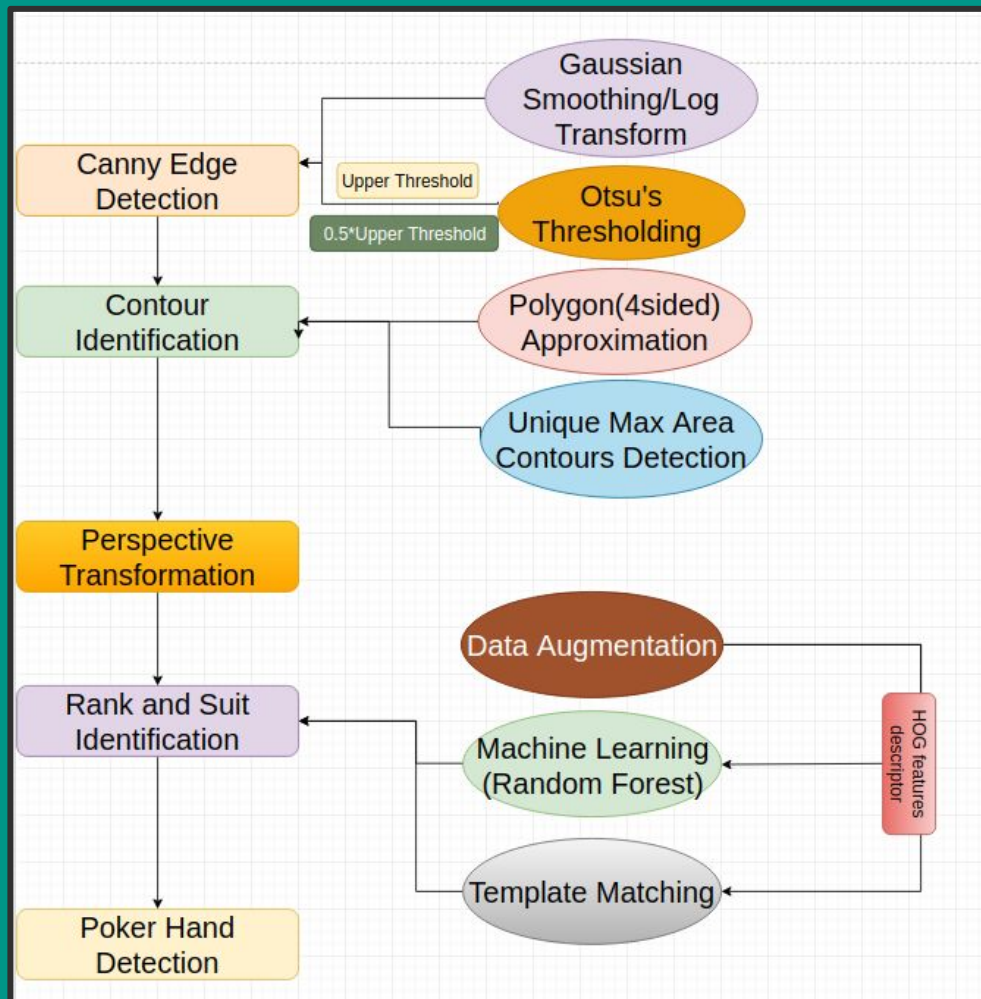
### **References:**

1. [Blog](#)
2. [Research Paper](#)
3. [Github Repo](#)

### **Future Work:**

1. Interpolate Cards if Overlapping.
2. Improve Card Detection Algorithm
3. Light created occlusion (glare on the cards)

## Schema Diagram for the Proposed Algorithm



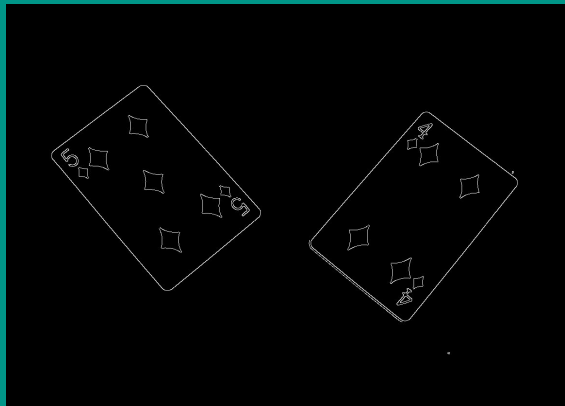
## Sample Outputs at different stages of Algorithm



Input Image



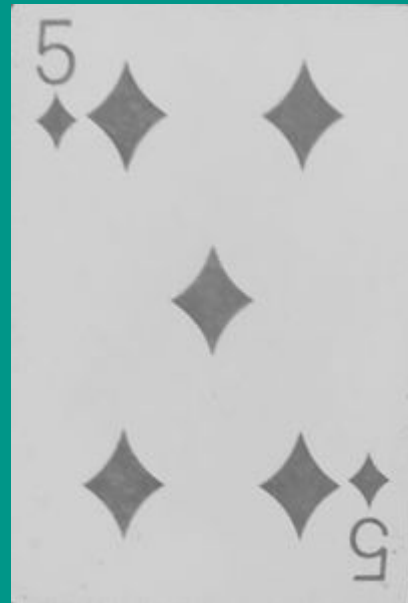
After Gaussian and Log Transformation



Canny Edge Detection using Otsu's Thresholding



Maximized Area and Unique Contour Detection



Controlling Perspective Distortion to Straighten Image

Template Matching

Data Augmentation

