

DETECTION OF CONCENTRIC CIRCULAR PATTERNS THROUGH FILTERS, OVAL DETECTION AND METAHEURISTICS.

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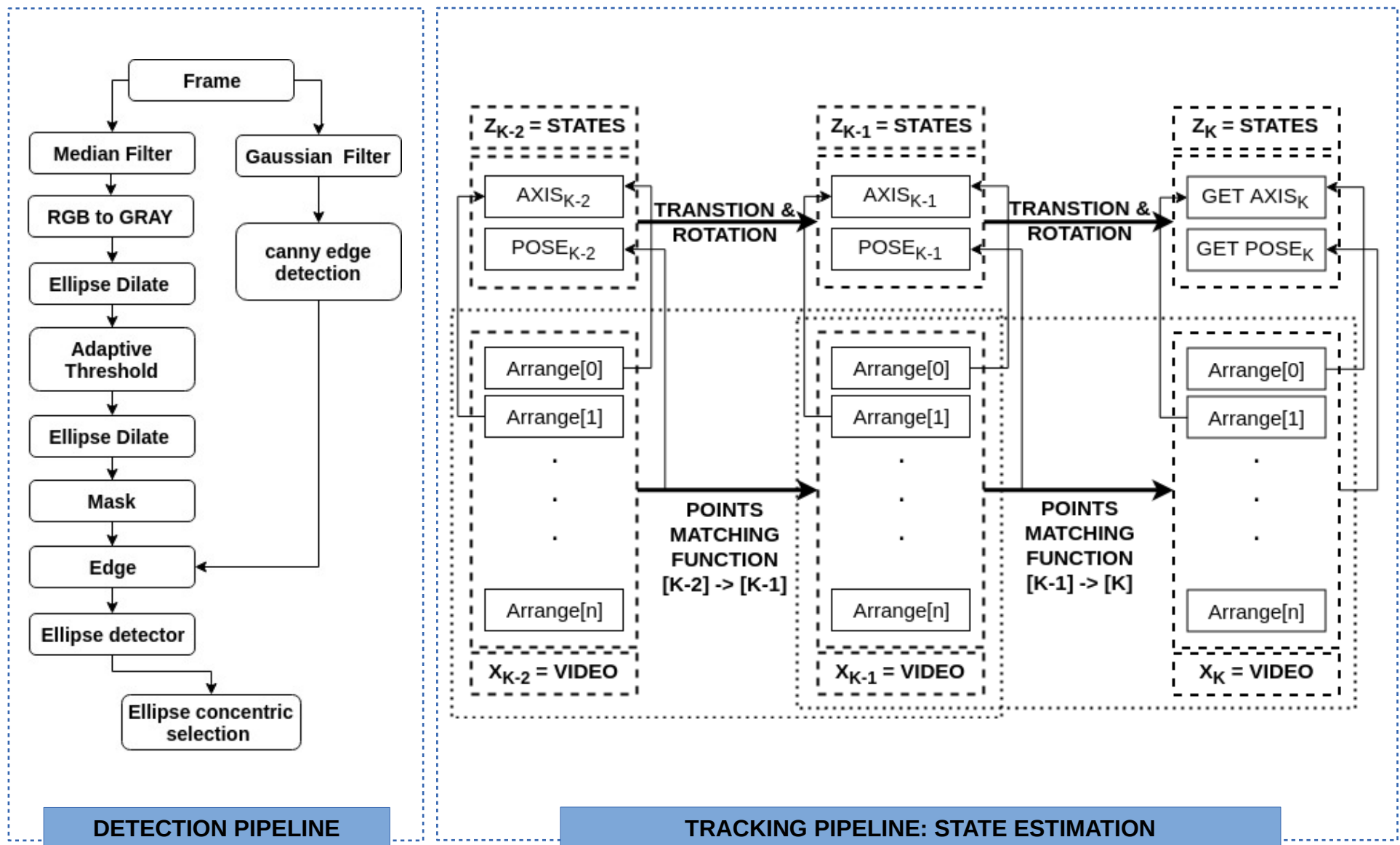
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DETECTION AND TRACKING STEP



DENSITY DISTRIBUTION

The sector density method include quad segmentation over scene, in our case we define 4x5 sectors due the window size and proportion. To set the maximum number of points per zone or density (p), we establish a maximum number of frames to use in calibration process (N_{frames}), then based on number of elements per arrange ($N_{arrange}$) and total number of sections ($N_{sections}$), we define equation 1:

$$p = \frac{N_{frames} * N_{arrange}}{N_{sections}} \quad (1)$$

Algorithm Density Distribution (Vector of IFrames):

$p = N_{frames} * N_{arrange} / N_{sections}$

for $S = 1$ **to** $N_{sections}$ **do**

for $F = 1$ **to** N_{frames} **do**

 Evaluate density with Iframes[F]

if Pass evaluation **then**

 Add frame to OFrames

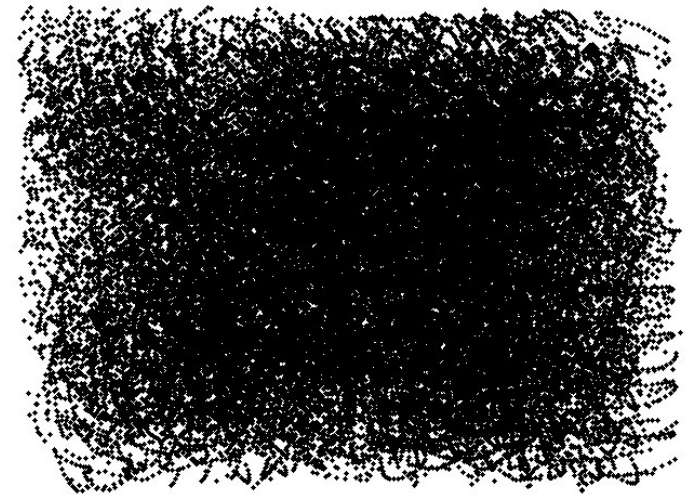
end if

end for

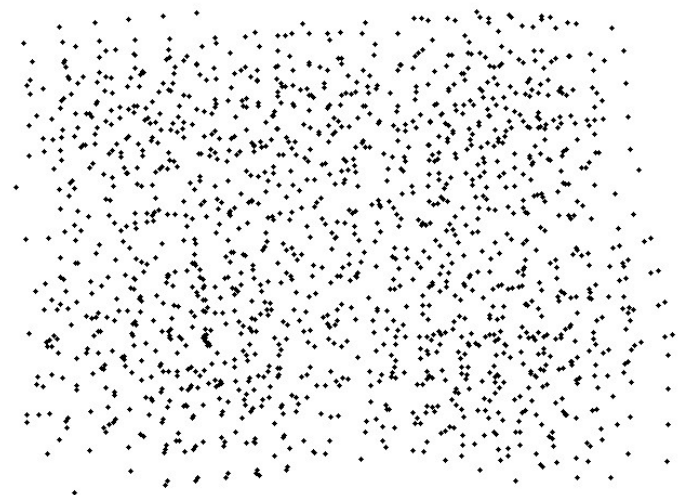
end for

return Vector of OFrames

DENSITY DISTRIBUTION ALGORITHM

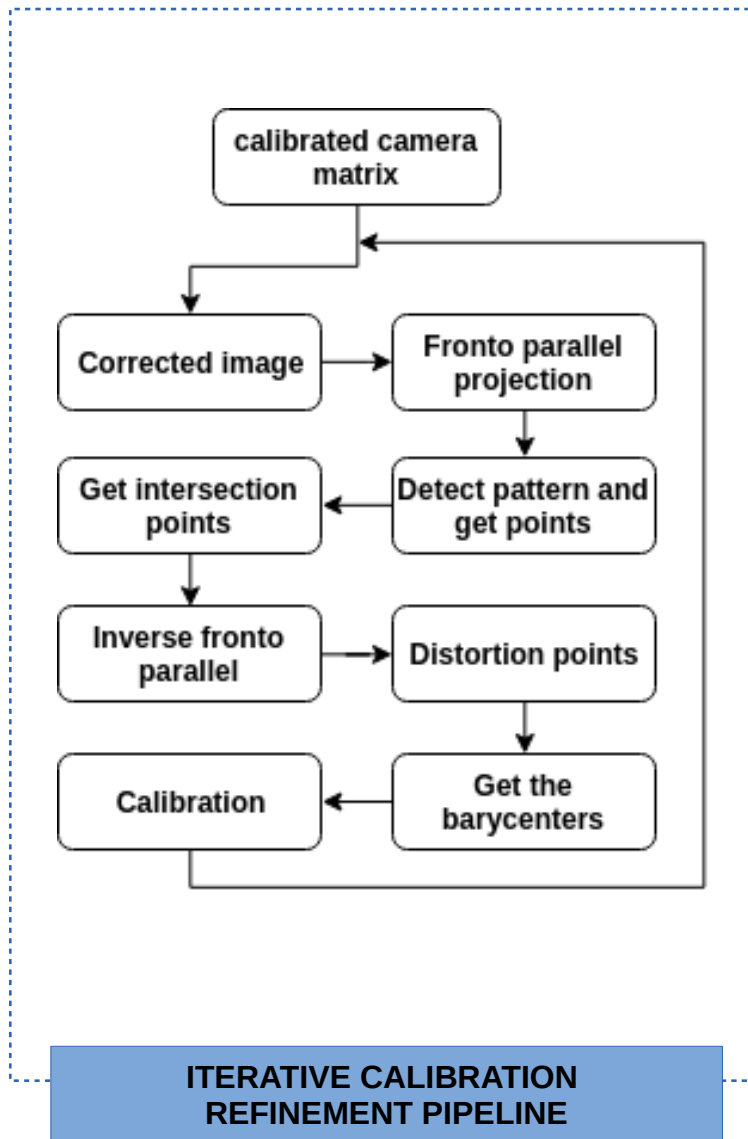


NO SAMPLED DISTRIBUTION:
CONCENTRIC RING



SAMPLED DISTRIBUTION WITH
RANDOM_SHUFFLE: CONCENTRIC RING

ITERATIVE CALIBRATION REFINEMENT



RESULTS: ASYMMETRIC DISCS



RESULTS: CHESSBOARD



RESULTS: CONCENTRIC RINGS



RESULTS: FINAL COMPARATIONS



CONCLUSIONS

