valid_in Cb Y Cr

TransCb

TransCr

Cx

Cy

−sint cost

cost sint

X X

X X

+

+

ECx

ECy

−

−

X

X

1/A2 1/B2

X

X

+

Radius

<= radius?

−

fac

X

0

valid_out skinscore

Cr Y

MeanCr (LUT)

Wcr/ WidthCr (LUT)

(K_l<=Y && Y<=K_h)
     ? 1 : 0

−

X

MeanCr(k_h)

+

TransCr

The design has an input/output rate of 1 pixel/score per clock tick (cycle).

So effectively, 1 score takes 1 clock period to compute.

The clock period is 1/100,000,000 seconds (assuming 100MHz clock). Accordingly a score takes 10ns.

The throughput is therefore 100,000,000 scores/second.

A single 1920x1080 image has 2,073,600 scores to be computed.

This design will process this in 2,073,600/100,000,000 = .020 seconds.

The fps is therefore 1/.02 = 48.

However, this design should be quad core'd since our input comes in at four pixels per cycle.

The expected FPS will be 48*4 = 192!

Resource Estimate:
< 30 DSP -> 12 Adders/Subtractors and 11 Multipliers
< 6 BRAMs
< 2000 LUTs
< 4000 REGs

Can you do better?