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#           APPENDIX A
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#include "SkinToneDetector.h"
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unsigned char get_skinscore(unsigned char* image_ptr, int col,
int row)
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```
{
    double skinScore;
    double cost, sint;
    double TCr, TCb;
    double xx, yy;
    double A2, B2;
    float radius = 0.5;
    float fac = 255.0/radius;
    unsigned char Y;
    unsigned char Cr;
    unsigned char Cb;
    int pixel_index;

    cost = cos(Theta);
    sint = sin(Theta);
    A2 = A*A;
    B2 = B*B;

    pixel_index = ((row*IMAGE_WIDTH) + col) * 3;
    Y = *((int)image_ptr + pixel_index);
    Cr = *((int)image_ptr + pixel_index + 1);
    Cb = *((int)image_ptr + pixel_index + 2);

    if( K_l <= Y && Y <= K_h)
        TCr = Cr;
        TCb = Cb;
    else
        double MeanCr_Y;
        double MeanCb_Y;
        double WidthCr;
        double WidthCb;
        double MeanCr_K_h;
        double MeanCb_K_h;

        if(Y <= K_l)
            MeanCr_Y = 154.0 + 10.0*(K_l - Y)/(K_l - Y_min);
            MeanCb_Y = 108 + 10*(K_l - Y)/(K_l - Y_min);
            WidthCr = WL_Cr + (Y - Y_min)*(W_Cr -
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WL_Cr)/(K_l - Y_min);
    WidthCb = WL_Cb + (Y - Y_min)*(W_Cb -
WL_Cb)/(K_l - Y_min);

    else if(K_h <= Y)
        MeanCr_Y = 154.0 + 22.0*(Y - K_h)/(Y_max - K_h);
        MeanCb_Y = 108 + 10*(Y - K_h)/(Y_max - K_h);
        WidthCr = WH_Cr + (Y_max - Y)*(W_Cr -
WH_Cr)/(Y_max - K_h);
        WidthCb = WH_Cb + (Y_max - Y)*(W_Cb -
WH_Cb)/(Y_max - K_h);

    else
        MeanCr_Y = 0.0;
        MeanCb_Y = 0.0;
        WidthCr = 0.0;
        WidthCb = 0.0

    if(K_h <= K_l)
        MeanCr_K_h = 154.0 + 10.0*(K_l - K_h)/(K_l -
Y_min);
        MeanCb_K_h = 108 + 10*(K_l - K_h)/(K_l - Y_min);
    else
        MeanCr_K_h = 154.0;
        MeanCb_K_h = 108;

    TCr = (Cr - MeanCr_Y) * (W_Cr / WidthCr) + MeanCr_K_h;
    TCb = (Cb - MeanCb_Y) * (W_Cb / WidthCb) + MeanCb_K_h;

    xx = cost*(TCb - Cx) + sint*(TCr - Cy);
    yy = -sint*(TCb - Cx) + cost*(TCr - Cy);

    skinScore = (xx - ECx)*(xx - ECx)/A2 + (yy - ECy)*(yy -
ECy)/B2;

    if(skinScore<=radius)
        return (unsigned char)(fac*(radius-skinScore));
    else
        return (unsigned char)0;
}

double MeanCr(unsigned char Y)
{
    if(Y <= K_l)
        return 154.0 + 10.0*(K_l - Y)/(K_l - Y_min);
    else if(K_h <= Y)
        return 154.0 + 22.0*(Y - K_h)/(Y_max - K_h);
    else
        return 0.0;
}

```