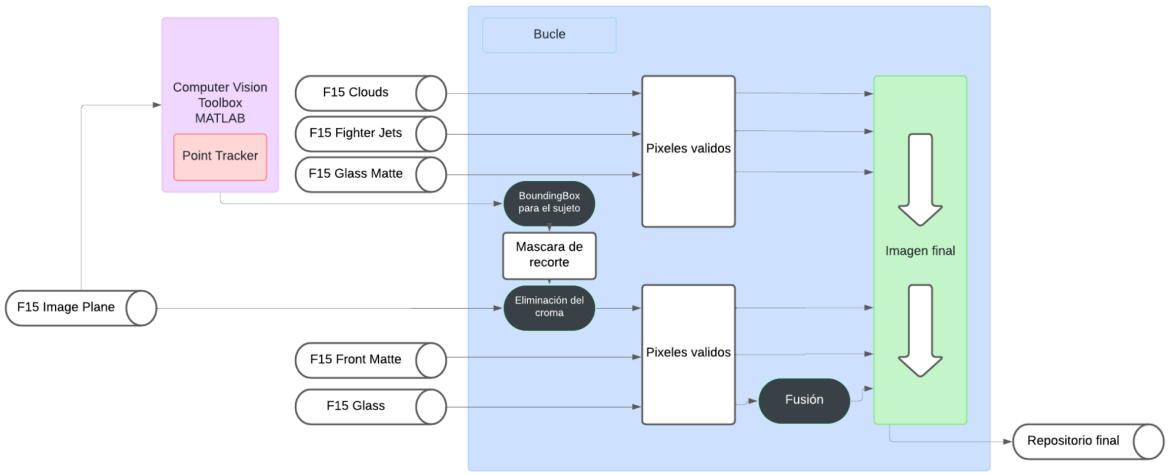
Procesamiento de video VFX mediante MATLAB

Presentado por

Christian Camelo Espinal Pasaporte: AW388156
Mattia Sorella NIE: Y1456532W

Imagen y video por computador



Carga de repositorios:

```
% Cargar tracking
load('pilot-tracker.mat');

directory = './F15 Image Plane';
directoryOcean = './F15 Ocean';
directoryJets = './F15 Fighter Jets';
directoryFrontMate = './F15 Front Matte';
directoryGlassMate = './F15 Glass';
directoryGlassBack = './F15 Glass Matte';

files = dir(fullfile(directory, '*.png'));
oceanFiles = dir(fullfile(directoryOcean, '*.png'));
jetsFiles = dir(fullfile(directoryJets, '*.png'));
frontFiles = dir(fullfile(directoryFrontMate, '*.png'));
glassBackFiles = dir(fullfile(directoryGlassBack, '*.png'));
glassFiles = dir(fullfile(directoryGlassMate, '*.png'));

processedDirectory = './F15 Image Plane-noBG';
if ~exist(processedDirectory, 'dir')
    mkdir(processedDirectory);
end

outputVideo = VideoWriter('output.mp4', 'MPEG-4');
open(outputVideo);

```

Bucle:

Carga de BBox

```
% Bucle para la longitud del directorio principal
for i = 1:length(files)

    % Carga del Bbox
    bbox = gTruth.LabelData{i, 1};
    bbox = cell2mat(bbox);
    bbox = round(bbox);

    if ~isempty(bbox)
        lastBbox = bbox;
    elseif ~isempty(lastBbox)
        bbox = lastBbox;
    else
        continue;
    end

    % Verificar tamaño del Bbox
    bbox(1) = min(bbox(1), size(img, 2));
    bbox(2) = min(bbox(2), size(img, 1));
    bbox(3) = min(bbox(1) + bbox(3), size(img, 2)) - bbox(1);
    bbox(4) = min(bbox(2) + bbox(4), size(img, 1)) - bbox(2);

```

Crear Mascara:

```
    %-----------------------------------------------------------------------
    % 1. Quita todo lo que esté fuera del bbox
    % ----------------------------------------------------------------------
    mask = false(size(img, 1), size(img, 2));
    mask(bbox(2):bbox(2)+bbox(4), bbox(1):bbox(1)+bbox(3)) = true;
    imgMasked = bsxfun(@times, img, cast(mask, class(img)));
    region = imgMasked(bbox(2):bbox(2)+bbox(4), bbox(1):bbox(1)+bbox(3), :);

    %-----------------------------------------------------------------------
    % 2. Quitar todo el croma de dentro de la imagen
    % ----------------------------------------------------------------------
    hsvImage = rgb2hsv(region);
    greenThreshold = hsvImage(:,:,1) > 0.25 & hsvImage(:,:,1) < 0.75 ...
        & hsvImage(:,:,2) > 0.2 & hsvImage(:,:,3) > 0.3;
    greenMask = repmat(greenThreshold, [1, 1, 3]);
    region = bsxfun(@times, region, cast(~greenMask, 'like', region));

    %-----------------------------------------------------------------------
    % 3. Quitar pixeles negros
    % ----------------------------------------------------------------------
    blackGreenThreshold = hsvImage(:,:,1) > 0.25 & hsvImage(:,:,1) < 0.75 ...
        & hsvImage(:,:,2) > 0.1 & hsvImage(:,:,3) < 0.35;
    blackGreenMask = repmat(blackGreenThreshold, [1, 1, 3]);
    region = bsxfun(@times, region, cast(~blackGreenMask, 'like', region));
    se = strel('disk', 5);
    greenMask = imerode(greenMask, se);
```

Aplicar máscara y cargar capas:

```
    % Crear la region de la mascara el sujeto
    region = bsxfun(@times, region, cast(~greenMask, 'like', region));

    % Reemplazar la region
    imgMasked(bbox(2):bbox(2)+bbox(4), bbox(1):bbox(1)+bbox(3), :) = region;

    % Cargar capas
    img = imread(fullfile(directory, files(i).name));
    oceanImage = imread(fullfile(directoryOcean, oceanFiles(i).name));
    jetImage = imread(fullfile(directoryJets, jetsFiles(i).name));
    frontImage = imread(fullfile(directoryFrontMate, frontFiles(1).name));
    glassImage = imread(fullfile(directoryGlassMate, glassFiles(i).name));
    glassBackImage = imread(fullfile(directoryGlassBack, glassBackFiles(i).name));

    % Asegurar el tamaño de todas las capas
    oceanImage = imresize(oceanImage, [size(img, 1), size(img, 2)]);
    jetImage = imresize(jetImage, [size(img, 1), size(img, 2)]);
    frontImage = imresize(frontImage, [size(img, 1), size(img, 2)]);
    glassBackImage = imresize(glassBackImage, [size(img, 1), size(img, 2)]);
```

Aplicar capas y guardar:

```
    % Cargar imagen final capa a capa donde los pixeles sean validos
    imgFinal = oceanImage;

    maskNonBlackJet = jetImage ~= 0;
    imgFinal(maskNonBlackJet) = jetImage(maskNonBlackJet);

    maskNonBlackGlass = glassBackImage ~= 0;
    imgFinal(maskNonBlackGlass) = jetImage(maskNonBlackGlass);

    maskNonBlack = imgMasked ~= 0;
    imgFinal(maskNonBlack) = imgMasked(maskNonBlack);

    maskNonBlackFront = frontImage ~= 0;
    imgFinal(maskNonBlackFront) = frontImage(maskNonBlackFront);

    imgFinal = imfuse(imgFinal,glassImage,'blend');

    % Salvar imagen final
    imwrite(imgFinal, fullfile(processedDirectory, files(i).name), 'png');
    writeVideo(outputVideo, imgFinal);
end

close(outputVideo);
```

Resultado:

Acceso:

https://github.com/MattiaSorella/ivc-proyecto.git

https://drive.google.com/file/d/1ybPZbi8CSGpsWrCEJfiVeQY8_VU-S2r8/view?usp=sharing