Software Engineering Group L - Batch 2018

User Manual - Part-1

This is the extensive manual for using the centroiding system to obtain info about the target.

Introduction

Aim

Given a source and destination of the target, generate grayscale images which depict the traversal of the target at a generalized sampling period of one second.

PRODUCT & PROCESS

Requirements

1. A Personal Computer with the latest working version of MATLAB.
2. A basic knowledge of MATLAB.
3. A basic knowledge of target detection and tracking.

Quick Start

1. Change working directory of MATLAB to the folder in which the images should be generated for further use.

2. Call the img_gen function with enough input arguments, to generate images and create a few global variables for their usage in montage generation and traversal depiction

USING THE FUNCTIONS

- img_gen(start_pt, end_pt, a_x, a_y, vel, img_edge,targ_int): This function generates grayscale images of a target travelling from ‘start_pt’ to ‘end_pt’ with a velocity ‘vel’. It is based on gaussian plume model and hence takes in semi-axes of the target - a_x and a_y, and the maximum intensity of the target, ‘targ_int ’. This function also needs the length of the edge of the image that has to be generated. The output is images generated from the given parameters stored as a PNG file under the name ‘test_i.png’ where i varies from zero to n-1 where ‘n’ is the total number of images generated. Every image is an inverted cartesian plane with origin at the centre of the image and y-coordinate increasing in the downward direction.

- Display_img(file_path): This function generates a mesh diagram of the target at various instances during the traversal. The function takes in the absolute path of the folder where the images are generated. The mesh diagrams contains peaks which indicates the target and plots the position of the target in every alternate image for small number of images and in every fourth image when there are large number of images

- Img_coll(file_path): This function also takes in the absolute path of the folder where the images are produced. This function displays the generated images in a rectangular montage. The output is an image with all the target images merged into one chronologically. This allows one to clearly understand and visualize the course of the target over all the images created by the img_gen function.

PRECAUTIONS :

- Users must call the image generation function before they use other functions in order to get a correct output

- The users should delete the images already present before every image generation.

- Make sure that there are no images(PNG files) ,which are not related to the application, starting with ‘test_’ in the working directory.

- Clear all the variables by using keyword 'clear' on the workspace before every tracking.

RESOURCES

Mailing lists

For any more information on the system contact on the following email id.

- togarusuryateja1999@gmail.com

References

A handbook of algorithms . Tracking and data fusion. - Yaakov Bar-Shalom.

Software Engineering Group L - Batch 2018

User Manual - Part-2

This is the extensive manual for using the centroiding system to obtain info about the target.

Introduction

Aim

Given any image which contains a target, we calculate its location and provide its co-ordinate (w.r.t centre of the frame). Variance in the centroid is also calculated along with contrast of the image.

PRODUCT & PROCESS

Requirements

1. A Personal Computer with the latest working version of MATLAB.
2. A basic knowledge of MATLAB.
3. A basic knowledge of target detection and tracking.

Quick Start

1. Change working directory of MATLAB to the folder containing all the scripts or copy all the scripts to the current working directory.
2. Generate images using img_gen function to store global variables which are then used for centroiding, centroid variance and contrast.
3. Run the appropriate commands or function in the Matlab command window to store the image as a matrix having its elements as intensities.

USING THE FUNCTIONS

- imread(image_name) : This is an inbuilt Matlab function .it converts a given image into a matrix displaying the intensity at each pixel.

- Centroid(Intensity_location): This function calculates the centroid of the target. It takes the intensities of pixels of the frame containing the target and returns its location (coordinates w.r.t centre of the frame). The frame should be of odd grid. If Gray image is not provided then before centroid calculation it is converted into a Gray image.

- gpt_variance(Intensity_location, centroid, variance): This function calculates the variance of the centroid of the Gaussian plume target. It takes the intensities of the pixels of the frame containing the target, centroid of the target, variance of the noise introduced in the frame as inputs and returns the variance of the centroid. The semi axes and maximum intensity of the target are already stored as global variables from img_gen.

- gpt_contrast(Intensity_location): This function calculates the contrast of the Gaussian plume target. It takes the intensities of pixels of the frame containing the target and returns its contrast. The semi axes and maximum intensity of the target are already stored as global variables from img_gen.

- Target_stats(img_name, variance): This function calculates the centroid, variance of the centroid and its contrast. It takes the name of the image and variance of noise as inputs.The semi axes and maximum intensity of the target are already stored as global variables from img_gen so it is required to first generate the images so as to get correct values.

- centroid_variance(centroid, size, frame_SNR, Contrast, total_target_intensity): This function calculates the variance of the centroid of the target. It takes intensities of pixels of the frame containing the target, centroid of the target, variance of the noise introduced, total target related intensity as inputs and returns the variance of the centroid.

PRECAUTIONS :

- The users should delete all the images and clear all the variables by using keyword 'clear' on the workspace before every tracking.

RESOURCES

Mailing lists

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References

A handbook of algorithms . Tracking and data fusion. - Yaakov Bar-Shalom.

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User Manual - Part-3

This is the extensive manual for using the tracking system.

Introduction

Aim

Given a set of infrared images , we use them to predict the position of the moving object using White noise model .

PRODUCT & PROCESS

Requirements

4. A Personal Computer with the latest working version of MATLAB.
5. A basic knowledge of MATLAB

Quick Start

4. Change working directory of MATLAB to the folder containing all the scripts or copy all the scripts to the current working directory.
5. Run the appropriate script or function in the Matlab command window.
6. Change the inputs of img_gen in final_2 for different end and start points,velocities etc.

USING THE FUNCTIONS

- imread() : This is an inbuilt Matlab function .it converts a given image into a matrix displaying the intensity at each pixel.

PRECAUTIONS :

- The users should delete all the images and clear all the variables by using keyword 'clear' on the workspace before every tracking.

RESOURCES

Mailing lists

For any more information on the system contact on the following email id.

- dhaarna1999@gmail.com

References

A handbook of algorithms . Tracking and data fusion. - Yaakov Bar-Shalom.

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User Manual - Part-3

This is the extensive manual for using the tracking system.

Introduction

Aim

Given a set of infrared images , we use them to predict the position of the moving object using White noise model .

PRODUCT & PROCESS

Requirements

4. A Personal Computer with the latest working version of MATLAB.
5. A basic knowledge of MATLAB

Quick Start

3. Change working directory of MATLAB to the folder containing all the scripts or copy all the scripts to the current working directory.
4. Run the appropriate script or function in the Matlab command window.
5. Change the inputs of img_gen in final_2 for different end and start points,velocities etc.

USING THE FUNCTIONS

- imread() : This is an inbuilt Matlab function .it converts a given image into a matrix displaying the intensity at each pixel.

PRECAUTIONS :

- The users should delete all the images and clear all the variables by using keyword 'clear' on the workspace before every tracking.

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