

Human Object Detector

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Chapter 1

Class Index

1.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

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Chapter 2

File Index

2.1 File List

Here is a list of all documented files with brief descriptions:

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Chapter 3

Class Documentation

3.1 Camera Class Reference

A class that read images or videos from the directory.

```
#include <camera.hpp>
```

Public Member Functions

- cv::VideoCapture [LoadVideo](#) (std::string Videodirectory, const std::string &VideoOrImage)
Reading the video or image from the directory.
- [Camera](#) ()
Construct a new [Camera::Camera](#) object.

Public Attributes

- std::string [videoorimage](#)
- cv::VideoCapture [cap](#)

3.1.1 Detailed Description

A class that read images or videos from the directory.

3.1.2 Constructor & Destructor Documentation

3.1.2.1 Camera()

```
Camera::Camera ( )
```

Construct a new [Camera::Camera](#) object.

3.1.3 Member Function Documentation

3.1.3.1 LoadVideo()

```
cv::VideoCapture Camera::LoadVideo (
    std::string Videodirectory,
    const std::string & VideoOrImage )
```

Reading the video or image from the directory.

Parameters

<i>Videodirectory</i>	
<i>VideoOrImage</i>	

Returns

cv::VideoCapture

Parameters

<i>Videodirectory</i>	Loadin the Video Directory
-----------------------	----------------------------

Returns

cv::VideoCapture

3.1.4 Member Data Documentation

3.1.4.1 videoorimage

```
std::string Camera::videoorimage
```

@Param VideoObject This store the object of the video @Param VideoDirectory Read video directory from system
@Param cap Load video into the VideoCapture

The documentation for this class was generated from the following files:

- /home/shantanu/Submission_Fall_2022/ENPM_808X/Coveralls/include/[camera.hpp](#)
- /home/shantanu/Submission_Fall_2022/ENPM_808X/Coveralls/app/src/camera.cpp

3.2 Detector Class Reference

A class that detect and add Person object for the vector.

```
#include <detector.hpp>
```

Public Member Functions

- [Detector](#) (cv::VideoCapture Cap, const std::string &InputType)
Construct a new [Detector](#) object.
- bool [DetectorSystem](#) (const cv::Mat &frame)
Initialize the frame and send it to the YOLO model and store the bounding box of the detected object.
- int [DrawBoundingBox](#) ()
- void [drawPred](#) (int left, int right, int top, int bottom, int idname, double x, double y, double z)
Drawing the bounding box and lable on the frame.
- void [getOutputsNames](#) ()
Reading the names of classes from coco.names.
- cv::Mat [CleanAndDisplay](#) ()
Return the imageafter drawing and cleaning the bounding boxes.
- [~Detector](#) ()
Destroy the [Detector](#) object.

Public Attributes

- bool **isInitialized** = false
- float **confThreshold** = 0.6
- float **nmsThreshold** = 0.3
- int **inputWidth** = 416
- int **inputHeight** = 416
- std::string **modelConfiguration** = "../cfg/yolov3.cfg"
- std::string **modelWeights** = "../cfg/yolov3.weights"
- std::string **cocoFile** = "../cfg/coco.names"
- std::string **outputFile**
- std::string **inputType**
- std::vector< std::string > **classes**
- std::vector< int > **objectTrackingid**
- std::vector< float > **confidences**
- std::vector< cv::Rect > **boxes**
- std::vector< cv::Rect > **trackerBoxes**
- std::vector< cv::Mat > **frameResult**
- std::vector< std::string > **names**
- std::vector< int > **classIds**
- std::vector< std::array< double, 3 > > **roboticRefFrame**
- cv::VideoCapture **cap**
- cv::Mat **outputFrame**
- cv::Mat **frame**
- int **widthRatio**
- int **heightRatio**
- cv::dnn::Net **net**
- cv::Size **newSize**
- cv::VideoWriter **video**
- std::vector< int > **index**

3.2.1 Detailed Description

A class that detect and add Person object for the vector.

3.2.2 Constructor & Destructor Documentation

3.2.2.1 Detector()

```
Detector::Detector (
    cv::VideoCapture Cap,
    const std::string & Inputstype )
```

Construct a new [Detector](#) object.

Construct a new [Detector::Detector](#) object.

Parameters

<i>Cap</i>	
<i>InputType</i>	

3.2.2.2 ~Detector()

```
Detector::~~Detector ( )
```

Destroy the [Detector](#) object.

Destroy the [Detector::Detector](#) object.

3.2.3 Member Function Documentation

3.2.3.1 CleanAndDisplay()

```
cv::Mat Detector::CleanAndDisplay ( )
```

Return the imageafter drawing and cleaning the bounding boxes.

Returns

cv::Mat

3.2.3.2 DetectorSystem()

```
bool Detector::DetectorSystem (
    const cv::Mat & Frame )
```

Initialize the frame and send it to the YOLO model and store the bounding box of the detected object.

Parameters

<i>Frame</i>	
--------------	--

Returns

true
false

3.2.3.3 DrawBoundingBox()

```
int Detector::DrawBoundingBox ( )
```

@Brief Draw bounding box for the image and filter the low confident

3.2.3.4 drawPred()

```
void Detector::drawPred (
    int left,
    int right,
    int top,
    int bottom,
    int idname,
    double x,
    double y,
    double z )
```

Drawing the bounding box and lable on the frame.

Parameters

<i>left</i>	
<i>right</i>	
<i>top</i>	
<i>bottom</i>	
<i>idname</i>	
<i>x</i>	
<i>y</i>	
<i>z</i>	

3.2.3.5 getOutputsNames()

```
void Detector::getOutputsNames ( )
```

Reading the names of classes from coco.names.

3.2.4 Member Data Documentation

3.2.4.1 confThreshold

```
float Detector::confThreshold = 0.6
```

@Param confThreshold threshold for confidence @Param nmsThreshold Non-maximum suppression threshold @Param inputWidth Width of the input image @Param inputHeight Height of the input image @Param model← Configuration yolov3.cfg directory @Param modelWeights yolov3.weights directory @Param cocoFile coco.names directory @Param outputFile The output of the file name @Param inputType separate video or image input type @Param classes store the coco.names classes @Param objectTrackingid Store the person id from tracking system into a vector @Param confidences store the confidences result into vector @Param boxes store the bounding box result into vector @Param frameResult store the result frame @Param names store the model names @Param roboticRefFrame Store the x, y and z factor @Param cap store the video capture object @Param outputFrame store the video capture object @Param frame store the video capture object @Param widthRatio store the video capture object @Param heightRatio store the video capture object @Param net store the video capture object @Param newSize store the video capture object

The documentation for this class was generated from the following files:

- /home/shantanu/Submission_Fall_2022/ENPM_808X/Coveralls/include/detector.hpp
- /home/shantanu/Submission_Fall_2022/ENPM_808X/Coveralls/app/src/detector.cpp

3.3 Human_Tracker Class Reference

A class that starts the whole system.

```
#include <human_tracker.hpp>
```

Public Member Functions

- [Human_Tracker](#) ()
Construct a new [Human_Tracker](#) object.
- void [SetVideoDirectory](#) (const std::string &Videodirectory)
Set the Video Directory object.
- std::string [GetVideoDirectory](#) ()
Get the Video Directory object.
- [~Human_Tracker](#) ()
Destroy the [Human_Tracker](#) object.

Public Attributes

- bool `isInitialized` = false
- std::string `videodirectory` = ""

3.3.1 Detailed Description

A class that starts the whole system.

3.3.2 Constructor & Destructor Documentation

3.3.2.1 Human_Tracker()

```
Human_Tracker::Human_Tracker ( )
```

Construct a new `Human_Tracker` object.

Construct a new `Human_Tracker::Human_Tracker` object.

3.3.2.2 ~Human_Tracker()

```
Human_Tracker::~~Human_Tracker ( )
```

Destroy the `Human_Tracker` object.

Destroy the `Human_Tracker::Human_Tracker` object.

3.3.3 Member Function Documentation

3.3.3.1 GetVideoDirectory()

```
std::string Human_Tracker::GetVideoDirectory ( )
```

Get the Video Directory object.

getting the path of the video directory

Returns

std::string

std::string returning the video directory

3.3.3.2 SetVideoDirectory()

```
void Human_Tracker::SetVideoDirectory (
    const std::string & Videodirectory )
```

Set the Video Directory object.

set the video directory that will be required for the loading video

Parameters

<i>Videodirectory</i>	
<i>Videodirectory</i>	for the video directory

3.3.4 Member Data Documentation

3.3.4.1 isInitialized

```
bool Human_Tracker::isInitialized = false
```

@Brief Create a Human [Tracker](#) class

The documentation for this class was generated from the following files:

- /home/shantanu/Submission_Fall_2022/ENPM_808X/Coveralls/include/[human_tracker.hpp](#)
- /home/shantanu/Submission_Fall_2022/ENPM_808X/Coveralls/app/src/[human_tracker.cpp](#)

3.4 Tracker Class Reference

A class for Tracking the Humans.

```
#include <tracker.hpp>
```

Public Member Functions

- [Tracker](#) ()
Construct a new [Tracker](#) object.
- [~Tracker](#) ()
Destroy the [Tracker](#) object.
- `std::vector< int > Tracking (const std::vector< cv::Rect > &Boxes)`
Compare the coordinate to check whether this object had appeared.
- `float DistanceCalculation (int x1, int x2, int y1, int y2)`
Calculate the distance between two dots for the detected object.
- `std::array< double, 3 > CoordinateTransform (int x, int y)`
Transform the coordinate to robot's reference frame.

Public Attributes

- bool `isInitialized` = false
- `std::vector< int >` `curid`
- `std::vector< cv::Rect >` `curBoxes`
- `std::vector< int >` `preid`
- `std::vector< int >` `checkDistance`
- `std::vector< int >` `checkid`
- `std::vector< int >` `keepid`
- `std::vector< std::pair< int, int > >` `curCenterPoint`
- `std::vector< std::pair< int, int > >` `PreCenterPoint`
- int `assignid` = 0
- `std::vector< std::array< double, 3 > >` `roboticRefFrame`

3.4.1 Detailed Description

A class for Tracking the Humans.

3.4.2 Constructor & Destructor Documentation

3.4.2.1 Tracker()

```
Tracker::Tracker ( )
```

Construct a new `Tracker` object.

Construct a new `Tracker::Tracker` object.

3.4.2.2 ~Tracker()

```
Tracker::~Tracker ( )
```

Destroy the `Tracker` object.

3.4.3 Member Function Documentation

3.4.3.1 CoordinateTransform()

```
std::array< double, 3 > Tracker::CoordinateTransform (
    int x,
    int y )
```

Transform the coordinate to robot's reference frame.

Parameters

<i>x</i>	
<i>y</i>	

Returns

`std::array<double, 3>`

3.4.3.2 DistanceCalculation()

```
float Tracker::DistanceCalculation (
    int x1,
    int x2,
    int y1,
    int y2 )
```

Calculate the distance between two dots for the detected object.

Parameters

<i>x1</i>	
<i>x2</i>	
<i>y1</i>	
<i>y2</i>	

Returns

`float`
`vector<float>`

3.4.3.3 Tracking()

```
std::vector< int > Tracker::Tracking (
    const std::vector< cv::Rect > & Boxes )
```

Compare the coordinate to check whether this object had appeared.

Tracking system.

Parameters

<i>Boxes</i>	
--------------	--

Returns

`std::vector<int>`
`vector<string>`

3.4.4 Member Data Documentation

3.4.4.1 `isInitialized`

```
bool Tracker::isInitialized = false
```

@Param `isInitialized` check if the system is initial @Param `curid` store name id @Param `curBoxes` store the bounding box information @Param `preid` store pervious name id @Param `allDistance` store distance information @Param `curCenterPoint` store the center point of the objects @Param `assignid` keep track of the id assigned

The documentation for this class was generated from the following files:

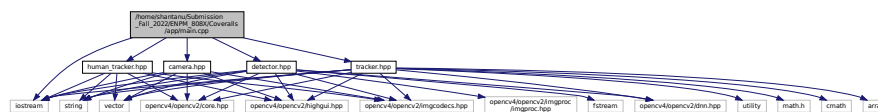
- /home/shantanu/Submission_Fall_2022/ENPM_808X/Coveralls/include/tracker.hpp
- /home/shantanu/Submission_Fall_2022/ENPM_808X/Coveralls/app/src/tracker.cpp

Chapter 4

File Documentation

4.1 /home/shantanu/Submission_Fall_2022/ENPM_808X/↵ Coveralls/app/main.cpp File Reference

```
#include <iostream>
#include <camera.hpp>
#include <tracker.hpp>
#include <human_tracker.hpp>
#include <detector.hpp>
Include dependency graph for main.cpp:
```



Functions

- `int main ()`

4.1.1 Detailed Description

Author

Shantanu Aman Po-Yu

Version

0.1

Date

2022-10-20

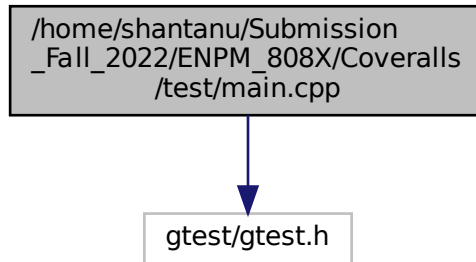
Copyright

Copyright (c) 2022

4.2 /home/shantanu/Submission_Fall_2022/ENPM_808X/↵ Coveralls/test/main.cpp File Reference

```
#include <gtest/gtest.h>
```

Include dependency graph for main.cpp:



Functions

- int `main` (int argc, char **argv)
main function

4.2.1 Detailed Description

Author

Shantanu Aman Po-Yu

Version

0.1

Date

2022-10-21

Copyright

Copyright (c) 2022

4.2.2 Function Documentation

4.2.2.1 `main()`

```
int main (  
    int argc,  
    char ** argv )
```

main function

Parameters

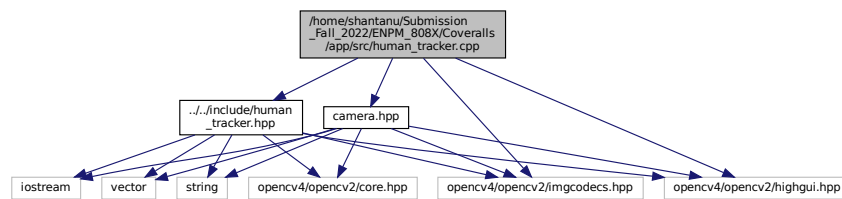
<i>argc</i>	
<i>argv</i>	

Returns

int

4.3 /home/shantanu/Submission_Fall_2022/ENPM_808X/Coveralls/app/src/human_tracker.cpp File Reference

```
#include "../..//include/human_tracker.hpp"
#include <camera.hpp>
#include <opencv4/opencv2/highgui.hpp>
#include <opencv4/opencv2/imgcodecs.hpp>
Include dependency graph for human_tracker.cpp:
```



4.3.1 Detailed Description

Author

Shantanu Aman Po-Yu

Version

0.1

Date

2022-10-21

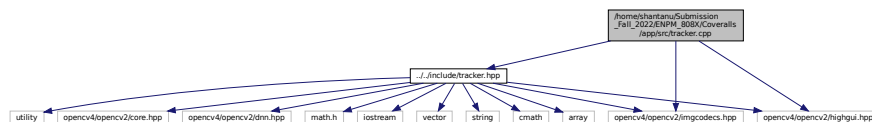
Copyright

Copyright (c) 2022

4.4 /home/shantanu/Submission_Fall_2022/ENPM_808X/↵ Coveralls/app/src/tracker.cpp File Reference

Implementation of the [Tracker](#) Class Methods.

```
#include "../include/tracker.hpp"
#include <opencv4/opencv2/imgcodecs.hpp>
#include <opencv4/opencv2/highgui.hpp>
Include dependency graph for tracker.cpp:
```



4.4.1 Detailed Description

Implementation of the [Tracker](#) Class Methods.

Author

Shantanu Po-Yu Aman

Version

0.1

Date

2022-10-29

Copyright

Copyright (c) 2022

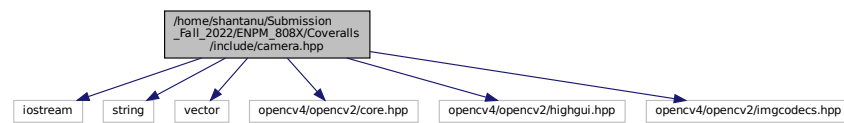
4.5 /home/shantanu/Submission_Fall_2022/ENPM_808X/↵ Coveralls/include/camera.hpp File Reference

[Camera](#) Class to initialize and set the camera settings.

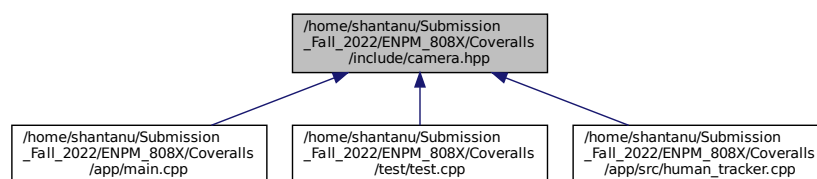
```
#include <iostream>
#include <string>
#include <vector>
#include <opencv4/opencv2/core.hpp>
#include <opencv4/opencv2/highgui.hpp>
```

```
#include <opencv4/opencv2/imgcodecs.hpp>
```

Include dependency graph for camera.hpp:



This graph shows which files directly or indirectly include this file:



Classes

- class [Camera](#)
A class that read images or videos from the directory.

4.5.1 Detailed Description

[Camera](#) Class to initialize and set the camera settings.

Author

Shantanu Aman Po-Yu

Version

0.1

Date

2022-10-21

Copyright

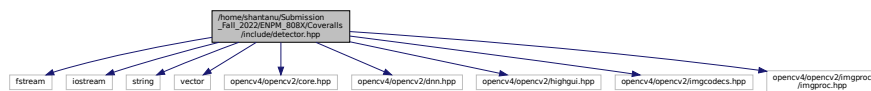
Copyright (c) 2022

4.6 /home/shantanu/Submission_Fall_2022/ENPM_808X/↵ Coveralls/include/detector.hpp File Reference

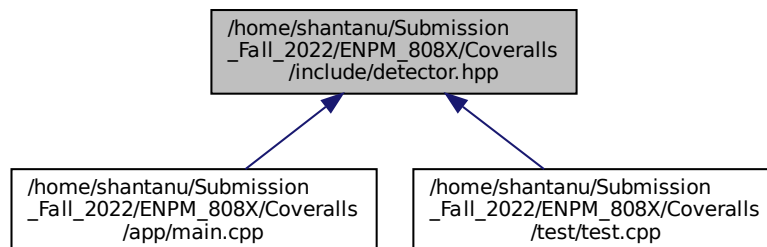
Template for the detector class.

```
#include <fstream>
#include <iostream>
#include <string>
#include <vector>
#include <opencv4/opencv2/core.hpp>
#include <opencv4/opencv2/dnn.hpp>
#include <opencv4/opencv2/highgui.hpp>
#include <opencv4/opencv2/imgcodecs.hpp>
#include <opencv4/opencv2/imgproc/imgproc.hpp>
```

Include dependency graph for detector.hpp:



This graph shows which files directly or indirectly include this file:



Classes

- class [Detector](#)

A class that detect and add Person object for the vector.

4.6.1 Detailed Description

Template for the detector class.

Implementation of [Detector](#) Class Methods.

Author

Shantanu Aman Po-Yu

Version

0.1

Date

2022-10-21

Copyright

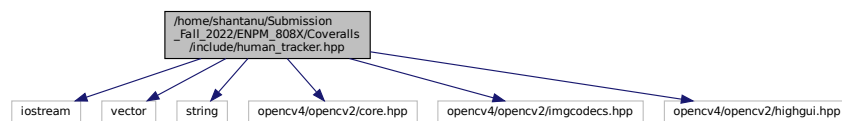
Copyright (c) 2022

4.7 /home/shantanu/Submission_Fall_2022/ENPM_808X/Coveralls/include/human_tracker.hpp File Reference

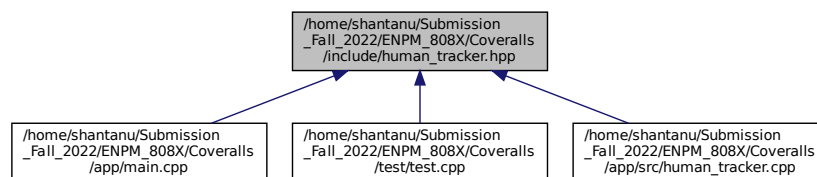
Template for the [Human_Tracker](#) Class.

```
#include <iostream>
#include <vector>
#include <string>
#include <opencv4/opencv2/core.hpp>
#include <opencv4/opencv2/imgcodecs.hpp>
#include <opencv4/opencv2/highgui.hpp>
```

Include dependency graph for human_tracker.hpp:



This graph shows which files directly or indirectly include this file:



Classes

- class [Human_Tracker](#)

A class that starts the whole system.

4.7.1 Detailed Description

Template for the [Human_Tracker](#) Class.

Author

Shantanu Aman Po-Yu

Version

0.1

Date

2022-10-21

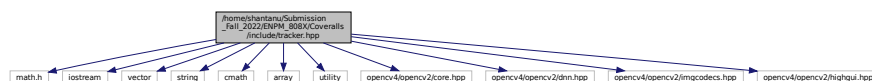
Copyright

Copyright (c) 2022

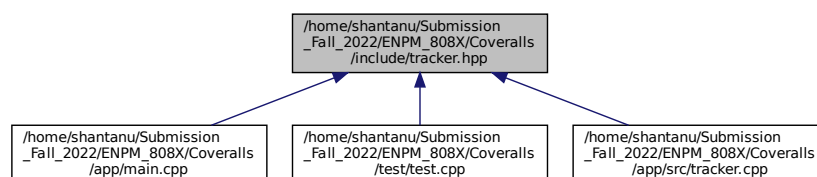
4.8 /home/shantanu/Submission_Fall_2022/ENPM_808X/Coveralls/include/tracker.hpp File Reference

```
#include <math.h>
#include <iostream>
#include <vector>
#include <string>
#include <cmath>
#include <array>
#include <utility>
#include <opencv4/opencv2/core.hpp>
#include <opencv4/opencv2/dnn.hpp>
#include <opencv4/opencv2/imgcodecs.hpp>
#include <opencv4/opencv2/highgui.hpp>
```

Include dependency graph for tracker.hpp:



This graph shows which files directly or indirectly include this file:



Functions

- `::testing::AssertionResult IsBetweenInclusive` (int val, int a, int b)
A function for integrating the test for verifying test output within a range.
- **TEST** (HumanTrackerTest, HumanTrackerConstructor)
Test for the Human [Tracker](#) Constructor and Destructor.
- **TEST** (HumanTrackerTest, HumanTrackerDestructor)
Construct a new TEST object for Human [Tracker](#).
- **TEST** (Path, ImagePathCheck)
Testing for the Human [Tracker](#) Function against an image.
- **TEST** (Path, VideoPathCheck)
Testing the Human [Tracker](#) against a video.
- **TEST** (CameraTest, VideoObjectCheck)
- **TEST** (DetectorTest, DetectorConstructorVideoTest)
Testing the [Detector](#) Constructor with the video route.
- **TEST** (DetectorTest, DetectorConstructorImageTest)
Testing the [Detector](#) Constructor with the image route.
- **TEST** (DetectorTest, DetectorDestructor2)
Testing the [Detector](#) Destructor.
- **TEST** (DetectorTest, getOutputsNamesCheckReadFile)
Test the label name is what we expect from coco.names.
- **TEST** (DetectorTest, getOutputsNamesCheck)
Read the label name size is equal to coco.names.
- **TEST** (DetectorTest, DetectObjectCheck0)
Testing the layername match to what we expected in DetectorSystem function.
- **TEST** (DetectorTest, FrameboxSizeWidthCheck)
Test the portion of width that needed to be resize.
- **TEST** (DetectorTest, DrawBoundingBoxHeightCheck)
Test the portion of width that needed to be resize.
- **TEST** (DetectorTest, DrawBoundingBoxWidthCheck)
Test the coordinate of the ounding box saved in the boxes member.
- **TEST** (DetectorTest, ClearBoxCheck)
Test does the function clean the detected object.
- **TEST** (DetectorTest, CleanAndDisplayCheck)
Test the center point for the detected object.
- **TEST** (TrackerTest, TrackerConstructor)
Testing the [Tracker](#).
- **TEST** (TrackerTest, TrackerDestructor)
Test case for tracker destructor.
- **TEST** (TrackerTest, DistanceCalculationCheck)
Test case for Distance Calculation.
- **TEST** (TrackerTest, TrackingFunctionCase1Check)
Test case1 for Tracking Calculation.
- **TEST** (TrackerTest, TrackingFunctionCase2Check)
Test case2 for Tracking Calculation.
- **TEST** (TrackerTest, TrackingFunctionCase3Check)
Test case3 for Tracking Calculation.
- **TEST** (TrackerTest, TrackingFunctionCase4Check)
Test case4 for Tracking Calculation.
- **TEST** (TrackerTest, CoordinateTransformCase1Check)
Test case1 for Coordinate Transform.
- **TEST** (TrackerTest, CoordinateTransformCase2Check)
Test case2 for Coordinate Transform.

Variables

- [Human_Tracker image1](#)
- [Human_Tracker video1](#)
- [Camera Camera1](#)
Test for the [Camera](#) Class.
- [Camera Camera3](#)
Testing the Video Loading.

4.9.1 Detailed Description

Test Suite.

@Author(s) Po-Yu Huang, Aman Sharma, Shantanu

Version

0.1

Date

2022-10-19

Copyright

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4.9.2 Function Documentation

4.9.2.1 IsBetweenInclusive()

```
::testing::AssertionResult IsBetweenInclusive (  
    int val,  
    int a,  
    int b )
```

A function for integrating the test for verifying test output within a range.

Parameters

<i>val</i>	
<i>a</i>	
<i>b</i>	

Returns

`::testing::AssertionResult`

4.9.2.2 TEST() [1/24]

```
TEST (
    DetectorTest ,
    CleanAndDisplayCheck )
```

Test the center point for the detected object.

4.9.2.3 TEST() [2/24]

```
TEST (
    DetectorTest ,
    ClearBoxCheck )
```

Test does the function clean the detected object.

4.9.2.4 TEST() [3/24]

```
TEST (
    DetectorTest ,
    DetectObjectCheck0 )
```

Testing the layername match to what we expected in DetectorSystem function.

4.9.2.5 TEST() [4/24]

```
TEST (
    DetectorTest ,
    DetectorConstructorImageTest )
```

Testing the [Detector](#) Constructor with the image route.

4.9.2.6 TEST() [5/24]

```
TEST (
    DetectorTest ,
    DetectorConstructorVideoTest )
```

Testing the [Detector](#) Constructor with the video route.

4.9.2.7 TEST() [6/24]

```
TEST (
    DetectorTest ,
    DetectorDestructor2 )
```

Testing the [Detector](#) Destructor.

4.9.2.8 TEST() [7/24]

```
TEST (
    DetectorTest ,
    DrawBoundingBoxHeightCheck )
```

Test the portion of width that needed to be resize.

4.9.2.9 TEST() [8/24]

```
TEST (
    DetectorTest ,
    DrawBoundingBoxWidthCheck )
```

Test the coordinate of the ounding box saved in the boxes member.

4.9.2.10 TEST() [9/24]

```
TEST (
    DetectorTest ,
    FrameboxSizeWidthCheck )
```

Test the portion of width that needed to be resize.

4.9.2.11 TEST() [10/24]

```
TEST (
    DetectorTest ,
    getOutputsNamesCheck )
```

Read the label name size is equal to coco.names.

4.9.2.12 TEST() [11/24]

```
TEST (
    DetectorTest ,
    getOutputsNamesCheckReadFile )
```

Test the label name is what we expect from coco.names.

4.9.2.13 TEST() [12/24]

```
TEST (
    HumanTrackerTest ,
    HumanTrackerConstructor )
```

Test for the Human [Tracker](#) Constructor and Destructor.

4.9.2.14 TEST() [13/24]

```
TEST (
    HumanTrackerTest ,
    HumanTrackerDestructor )
```

Construct a new TEST object for Human [Tracker](#).

4.9.2.15 TEST() [14/24]

```
TEST (
    Path ,
    ImagePathCheck )
```

Testing for the Human [Tracker](#) Function against an image.

4.9.2.16 TEST() [15/24]

```
TEST (
    Path ,
    VideoPathCheck )
```

Testing the Human [Tracker](#) against a video.

4.9.2.17 TEST() [16/24]

```
TEST (
    TrackerTest ,
    CoordinateTransformCase1Check )
```

Test case1 for Coordinate Transform.

4.9.2.18 TEST() [17/24]

```
TEST (
    TrackerTest ,
    CoordinateTransformCase2Check )
```

Test case2 for Coordinate Transform.

4.9.2.19 TEST() [18/24]

```
TEST (
    TrackerTest ,
    DistanceCalculationCheck )
```

Test case for Distance Calculation.

4.9.2.20 TEST() [19/24]

```
TEST (
    TrackerTest ,
    TrackerConstructor )
```

Testing the [Tracker](#).

Construct a new TEST object To check if the constructor is being called

4.9.2.21 TEST() [20/24]

```
TEST (
    TrackerTest ,
    TrackerDestructor )
```

Test case for tracker destructor.

4.9.2.22 TEST() [21/24]

```
TEST (
    TrackerTest ,
    TrackingFunctionCase1Check )
```

Test case1 for Tracking Calculation.

4.9.2.23 TEST() [22/24]

```
TEST (
    TrackerTest ,
    TrackingFunctionCase2Check )
```

Test case2 for Tracking Calculation.

4.9.2.24 TEST() [23/24]

```
TEST (
    TrackerTest ,
    TrackingFunctionCase3Check )
```

Test case3 for Tracking Calculation.

4.9.2.25 TEST() [24/24]

```
TEST (
    TrackerTest ,
    TrackingFunctionCase4Check )
```

Test case4 for Tracking Calculation.

4.9.3 Variable Documentation

4.9.3.1 Camera1

`Camera` Camera1

Test for the `Camera` Class.

4.9.3.2 Camera3

`Camera` Camera3

Testing the Video Loading.

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