Hierarchy For All Packages

Package Hierarchies:
com._604robotics.robot2012.vision, com._604robotics.robot2012.vision.config, com._604robotics.tcpcommunicator, com.charliemouse.cambozola.shared, com.mobvcasting.mjpegparser

Class Hierarchy

- java.lang.Object
  - com._604robotics.robot2012.vision.**AABB**
  - java.net.Authenticator
    - com.mobvcasting.mjpegparser.**HTTPAuthenticator**
  - com.charliemouse.cambozola.shared.**Base64**
  - java.awt.Component (implements java.awt.image.ImageObserver, java.awt.MenuContainer, java.io.Serializable)
    - java.awt.Container
      - javax.swing.JComponent (implements java.io.Serializable)
        - javax.swing.Box (implements javax.accessibility.Accessible)
          - com._604robotics.robot2012.vision.config.**LinkedSlider** (implements javax.swing.event.ChangeListener)
            - com._604robotics.robot2012.vision.config.**LinkedSlider.DoubleLinkedSlider**
              - com._604robotics.robot2012.vision.config.**LinkedSlider.ExponentialLinkedSlider**
            - com._604robotics.robot2012.vision.config.**LinkedSlider.IntLinkedSlider**
        - javax.swing.JPanel (implements javax.accessibility.Accessible)
          - com._604robotics.robot2012.vision.**VisionDisp**
  - com._604robotics.robot2012.vision.config.**Config**
  - com._604robotics.robot2012.vision.config.**Configger**
  - com._604robotics.robot2012.vision.**DistanceCalculations**
  - com._604robotics.robot2012.vision.**Img**
  - com._604robotics.robot2012.vision.**LinearRegression**
  - com._604robotics.robot2012.vision.**LinearRegression.RegressionResult**
    - com._604robotics.robot2012.vision.**LinearRegression.BackwardsRegressionResult**
  - com._604robotics.robot2012.vision.**Point2d**
  - com._604robotics.robot2012.vision.**Point3d**
  - com._604robotics.robot2012.vision.**Quad**
  - com._604robotics.robot2012.vision.**Result**
    - com._604robotics.robot2012.vision.**Result.AntiResult**
    - com._604robotics.robot2012.vision.**Result.PlusResult**
  - com._604robotics.robot2012.vision.**ResultImage**
  - com.charliemouse.cambozola.shared.**StreamSplit**
  - com._604robotics.robot2012.vision.**Target** (implements java.lang.Comparable<T>)
  - com._604robotics.tcpcommunicator.**TcpCommunicator** (implements java.lang.Runnable)
  - java.lang.Thread (implements java.lang.Runnable)
    - com.charliemouse.cambozola.shared.**CamStream**
  - com._604robotics.robot2012.vision.**VisionProcessing**

Serialized Form

Package com._604robotics.robot2012.vision

Class com._604robotics.robot2012.vision.VisionDisp extends javax.swing.JPanel implements Serializable

serialVersionUID: -2167719831931210343L

Serialized Fields

hasPainted

`boolean hasPainted`

This value is false until this window is done painting

image

`java.awt.image.BufferedImage image`

The background image, as received from the camera

resultImage

`ResultImage resultImage`

This is the tiled image indicating which pixels are in the target.

It is displayed as a large mask of red and green squares.

targetCorners

`Point2d[] targetCorners`

The corners to display on-screen

targetSides

`LinearRegression.RegressionResult[] targetSides`

The sides of the target

Package com._604robotics.robot2012.vision.config

Class com._604robotics.robot2012.vision.config.LinkedSlider extends javax.swing.Box implements Serializable

serialVersionUID: 1L

Serialized Fields

slider

`javax.swing.JSlider slider`

The slider that the user interacts with

valLabel

`javax.swing.JLabel valLabel`

The label that indicates the current value of the slider

nameLabel

`javax.swing.JLabel nameLabel`

The label that indicates the name of the slider

min

`int min`

The minimum value on the slider (must be an integer)

max

`int max`

The maximum value on the slider (must be an integer)

mul

`double mul`

A number to multiply all slider outputs by

Class com._604robotics.robot2012.vision.config.LinkedSlider.DoubleLinkedSlider extends LinkedSlider implements Serializable

Class com._604robotics.robot2012.vision.config.LinkedSlider.ExponentialLinkedSlider extends LinkedSlider.DoubleLinkedSlider implements Serializable

Serialized Fields

valMul

`double valMul`

What to multiply values

Class com._604robotics.robot2012.vision.config.LinkedSlider.IntLinkedSlider extends LinkedSlider implements Serializable

All Classes

AABB
Base64
CamStream
Config
Configger
DistanceCalculations
HTTPAuthenticator
Img
LinearRegression
LinearRegression.BackwardsRegressionResult
LinearRegression.RegressionResult
LinkedSlider
LinkedSlider.DoubleLinkedSlider
LinkedSlider.ExponentialLinkedSlider
LinkedSlider.IntLinkedSlider
Point2d
Point3d
Quad
Result
Result.AntiResult
Result.PlusResult
ResultImage
StreamSplit
Target
TcpCommunicator
VisionDisp
VisionProcessing

Deprecated API

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All Classes

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LinearRegression.BackwardsRegressionResult
LinearRegression.RegressionResult
LinkedSlider
LinkedSlider.DoubleLinkedSlider
LinkedSlider.ExponentialLinkedSlider
LinkedSlider.IntLinkedSlider
Point2d
Point3d
Quad
Result
Result.AntiResult
Result.PlusResult
ResultImage
StreamSplit
Target
TcpCommunicator
VisionDisp
VisionProcessing

Packages

Package	Description
com._604robotics.robot2012.vision	
com._604robotics.robot2012.vision.config	
com._604robotics.tcpcommunicator	
com.charliemouse.cambozola.shared	
com.mobvcasting.mjpegparser	

L

A B C D E F G H I L M P Q R S T U V W X Y Z

U

unhook() - Method in class com.charliemouse.cambozola.shared.CamStream

up() - Method in class com._604robotics.tcpcommunicator.TcpCommunicator

Enables the TcpCommunicator, launching the thread.

updateValLabel() - Method in class com._604robotics.robot2012.vision.config.LinkedSlider

This method updates the label on the right side that displays the current value

A B C D E F G H I L M P Q R S T U V W X Y Z

Y

B

Base64 - Class in com.charliemouse.cambozola.shared

com/charliemouse/cambozola/shared/CamStream.java
Copyright (C) Andy Wilcock, 2001.

Base64() - Constructor for class com.charliemouse.cambozola.shared.Base64

BOUNDARY_MARKER_PREFIX - Static variable in class com.charliemouse.cambozola.shared.StreamSplit

BOUNDARY_MARKER_TERM - Static variable in class com.charliemouse.cambozola.shared.StreamSplit

boxForTextField(JTextField, String) - Static method in class com._604robotics.robot2012.vision.config.Configger

A simple utility method that creates a javax.swing.Box that holds a label indicating the name of the variable to change and a text field for the user to type input into.

M

A B C D E F G H I L M P Q R S T U V W X Y Z

D

A B C D E F G H I L M P Q R S T U V W X Y Z

V

VisionDisp - Class in com._604robotics.robot2012.vision

This class is used to display a camera image and some debug information along with it.

VisionDisp() - Constructor for class com._604robotics.robot2012.vision.VisionDisp

A default constructor that sets this up as a 640x480 display

VisionProcessing - Class in com._604robotics.robot2012.vision

The main class for processing camera vision on our 2012 robot.

VisionProcessing() - Constructor for class com._604robotics.robot2012.vision.VisionProcessing

A constructor to create a new VisionProcessing

A B C D E F G H I L M P Q R S T U V W X Y Z

H

hasPlus() - Method in class com._604robotics.robot2012.vision.Result

hasPlus() - Method in class com._604robotics.robot2012.vision.Result.PlusResult

HTTPAuthenticator - Class in com.mobvcasting.mjpegparser
From http://www.walking-productions.com/notslop/2010/04/20/motion-jpeg-in-flash-and-java/

HTTPAuthenticator(String, String) - Constructor for class com.mobvcasting.mjpegparser.HTTPAuthenticator

A B C D E F G H I L M P Q R S T U V W X Y Z

G

A B C D E F G H I L M P Q R S T U V W X Y Z

T

A B C D E F G H I L M P Q R S T U V W X Y Z

P

I

A B C D E F G H I L M P Q R S T U V W X Y Z

Z

z - Variable in class com._604robotics.robot2012.vision.Point3d
The Z value

z - Variable in class com._604robotics.robot2012.vision.Target
x, y, and z represent the 3-d position of the target x will be positive when the target appears to be right of the center of the camera.

zUncertainty - Variable in class com._604robotics.robot2012.vision.Target
These are the uncertainties of the x, y, and z positions of the target.

A B C D E F G H I L M P Q R S T U V W X Y Z

R

Q

Quad - Class in com._604robotics.robot2012.vision

A class representing a Quadrilateral, with four corner points.

Quad(Point2d, Point2d, Point2d, Point2d) - Constructor for class com._604robotics.robot2012.vision.Quad

A B C D E F G H I L M P Q R S T U V W X Y Z

A

A B C D E F G H I L M P Q R S T U V W X Y Z

A B C D E F G H I L M P Q R S T U V W X Y Z

F

A B C D E F G H I L M P Q R S T U V W X Y Z

C

E

encode(byte[]) - Static method in class com.charliemouse.cambozola.shared.Base64
Returns base64 representation of specified byte array.
encode(byte[], int, int) - Static method in class com.charliemouse.cambozola.shared.Base64
Returns base64 representation of specified byte array.

A B C D E F G H I L M P Q R S T U V W X Y Z

W

writePoints(Target[]) - Method in class com._604robotics.tcpcommunicator.TcpCommunicator
Writes the specified points to the stream.

A B C D E F G H I L M P Q R S T U V W X Y Z

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A B C D E F G H I L M P Q R S T U V W X Y Z

X

x - Variable in class com._604robotics.robot2012.vision.Point2d
The X value

x - Variable in class com._604robotics.robot2012.vision.Point3d
The X value

x - Variable in class com._604robotics.robot2012.vision.Target
x, y, and z represent the 3-d position of the target x will be positive when the target appears to be right of the center of the camera

x1 - Variable in class com._604robotics.robot2012.vision.AABB

x2 - Variable in class com._604robotics.robot2012.vision.AABB

xUncertainty - Variable in class com._604robotics.robot2012.vision.Target
These are the uncertainties of the xy, and z positions of the target.

A B C D E F G H I L M P Q R S T U V W X Y Z

S

How This API Document Is Organized

This API (Application Programming Interface) document has pages corresponding to the items in the navigation bar, described as follows.

Overview

The Overview page is the front page of this API document and provides a list of all packages with a summary for each. This page can also contain an overall description of the set of packages.

Package

Each package has a page that contains a list of its classes and interfaces, with a summary for each. This page can contain six categories:

- Interfaces (italic)
- Classes
- Enums
- Exceptions
- Errors
- Annotation Types

Class/Interface

Each class, interface, nested class and nested interface has its own separate page. Each of these pages has three sections consisting of a class/interface description, summary tables, and detailed member descriptions:

- Class inheritance diagram
- Direct Subclasses
- All Known Subinterfaces
- All Known Implementing Classes
- Class/interface declaration
- Class/interface description
- Nested Class Summary
- Field Summary
- Constructor Summary
- Method Summary
- Field Detail
- Constructor Detail
- Method Detail

Each summary entry contains the first sentence from the detailed description for that item. The summary entries are alphabetical, while the detailed descriptions are in the order they appear in the source code. This preserves the logical groupings established by the programmer.

Annotation Type

Each annotation type has its own separate page with the following sections:

- Annotation Type declaration
- Annotation Type description
- Required Element Summary
- Optional Element Summary
- Element Detail

Enum

Each enum has its own separate page with the following sections:

- Enum declaration
- Enum description
- Enum Constant Summary
- Enum Constant Detail

Use

Each documented package, class and interface has its own Use page. This page describes what packages, classes, methods, constructors and fields use any part of the given class or package. Given a class or interface A, its Use page includes subclasses of A, fields declared as A, methods that return A, and methods and constructors with parameters of type A. You can access this page by first going to the package, class or interface, then clicking on the "Use" link in the navigation bar.

Tree (Class Hierarchy)

There is a Class Hierarchy page for all packages, plus a hierarchy for each package. Each hierarchy page contains a list of classes and a list of interfaces. The classes are organized by inheritance structure starting with `java.lang.Object`. The interfaces do not inherit from `java.lang.Object`.

- When viewing the Overview page, clicking on "Tree" displays the hierarchy for all packages.
- When viewing a particular package, class or interface page, clicking "Tree" displays the hierarchy for only that package.

Deprecated API

The Deprecated API page lists all of the API that have been deprecated. A deprecated API is not recommended for use, generally due to improvements, and a replacement API is usually given. Deprecated APIs may be removed in future implementations.

Index

The Index contains an alphabetic list of all classes, interfaces, constructors, methods, and fields.

Prev/Next

These links take you to the next or previous class, interface, package, or related page.

Frames/No Frames

These links show and hide the HTML frames. All pages are available with or without frames.

All Classes

The All Classes link shows all classes and interfaces except non-static nested types.

Serialized Form

Each serializable or externalizable class has a description of its serialization fields and methods. This information is of interest to re-implementors, not to developers using the API. While there is no link in the navigation bar, you can get to this information by going to any serialized class and clicking "Serialized Form" in the "See also" section of the class description.

Constant Field Values

The Constant Field Values page lists the static final fields and their values.

This help file applies to API documentation generated using the standard doclet.

Uses of Class com.mobvcasting.mjpegparser.HTTPAuthenticator

No usage of com.mobvcasting.mjpegparser.HTTPAuthenticator

Hierarchy For Package com.mobvcasting.mjpegparser

Package Hierarchies:
All Packages

Class Hierarchy

- java.lang.Object
  - java.net.Authenticator
    - com.mobvcasting.mjpegparser.**HTTPAuthenticator**

Package com.mobvcasting.mjpegparser

Class Summary

Class	Description
HTTPAuthenticator	From http://www.walking-productions.com/notslop/2010/04/20/motion-jpeg-in-flash-and-java/

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com.mobvcasting.mjpegparser

Classes

HTTPAuthenticator

Uses of Package com.mobvcasting.mjpegparser

No usage of com.mobvcasting.mjpegparser

com.mob vcasting.nz pegparser

Class HTTPAuthenticator

z ava. lang. Ob z ect
  z ava. netu Aehticator
    com.mob vcasting.nz pegparser. HTTPAtehticator

```
public class HTTPAuthenticator
extends java.net.Authenticator
```

From h ttp:/jwjww.walkingB productions.comj otslopj 6 4 / 4 jn4bt(onjB6z 4ejgB inB) lash B andB z avaj

Nested Class Summary

Nested classes/interfaces inherited from class java.net.Authenticator

java.net.Authenticator.RequestorType

Constructor Summary

Constructors

Constructor and Description
HTTPAuthenticator(java.lang.String user, java.lang.String pass)

Method Summary

Methods

Modifier and Type	Method and Description
protected java.net.PasswordAuthentication	**getPasswordAuthentication**()

Methods inherited from class java.net.Authenticator

getRequestingHost, getRequestingPort, getRequestingPrompt, getRequestingProtocol, getRequestingScheme, getRequestingSite, getRequestingURL, getRequestorType, requestPasswordAuthentication, requestPasswordAuthentication, requestPasswordAuthentication, setDefault

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

HTTPAuthenticator

```
public HTTPAuthenticator(java.lang.String user,
                         java.lang.String pass)
```

Method Detail

getPasswordAuthentication

```
protected java.net.PasswordAuthentication getPasswordAuthentication()
```

Overrides:

getPasswordAuthentication in class java.net.Authenticator

com.charliemouse.cambozola.shared

Class Base64

java.lang.Object
  com.charliemouse.cambozola.shared.Base64

```
public class Base64
extends java.lang.Object
```

com/charliemouse/cambozola/shared/CamStream.java
Copyright (C) Andy Booth, 2001.
Available from http://www.charliemouse.com

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Available from http://www.charliemouse.com

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See Also:

CamStream for more information.

Constructor Summary

Constructors

Constructor and Description
Base64()

Method Summary

Methods

Modifier and Type	Method and Description
static java.lang.String	encode(byte[] data) Returns base64 representation of specified byte array.
static java.lang.String	encode(byte[] data, int off, int len) Returns base64 representation of specified byte array.

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

Base64

```
public Base64()
```

Method Detail

encode

```
public static java.lang.String encode(byte[] data)
```

' eturns b ase6 4 represendatof specified by et array .

Parameters:

`dataF` - FeTdata to b e enoded

Returns:

Th e b ase6 4 oded data

encode

```
public static java.lang.String encode(byte[] data,
                      int off,
                      int len)
```

' eturns b ase6 4 represendatof specified by et array .

Parameters:

`dataF` - FeTdata to b e enoded

`off` - Th e offset with in th e data at wh ich start encoding

`len` - Th e lengthof th e datad encode

Returns:

Th e b ase6 4 oded data

com.charliemouse.cambozolashared

Class CamStream

java.lang.Object
  java.lang.Thread
    com.charliemouse.cambozolashared.CamStream

All Implemented Interfaces:

java.lang.Runnable

```
public class CamStream
extends java.lang.Thread
```

com/charliemouse/cambozola/shared/CamStream.java
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A few minor modifications to reduce latency have been made by Kevin Parker These modifications are intended to improve the speed/performance of MJPEG reading (latency has been reduced on my machine by another 10-20 ms; this is per-frame, so there are hundreds of ms of "waiting" reduced away. There are probably more changes that can still be made to greatly improve performance.)

I (Kevin Parker) made several changes to the following code. These include the following. I made the JPEG data stream pipe directly into the parser, rather than loading the whole image into a buffer before parsing. I made a couple of minor changes, one of which was reducing some of the sleep lengths. I also did some minor code auto-cleanup. Finally, I added several comments and javadocs. (I also altered m_retryDelay and removed some unused member variables).

This is not the full version of the Cambozola code, and it has many modifications to make it better suit the needs of a fast-paced FRC tournament. I also changed or removed unneeded pieces of these files.

Nested Class Summary

Nested classes/interfaces inherited from class java.lang.Thread

java.lang.Thread.State, java.lang.Thread.UncaughtExceptionHandler

Field Summary

Fields

Modifier and Type	Field and Description
static int	CONNECT_STYLE_HTTP
static int	CONNECT_STYLE_SOCKET

Fields inherited from class java.lang.Thread

MAX_PRIORITY, MIN_PRIORITY, NORM_PRIORITY

Constructor Summary

Constructors

Constructor and Description
CamStream(java.net.URL strm, java.lang.String app, java.net.URL docBase, int retryCount, int retryDelay, java.util.logging.Logger logger, boolean debug)

Method Summary

Methods

Modifier and Type	Method and Description
void	**finalize**()
java.awt.image.BufferedImage	**getCurrent**()
double	**getFPS**()
int	**getIndex**()
java.net.URL	**getStreamURL**()
java.lang.String	**getType**()
void	**run**()
void	**unhook**()

Methods inherited from class java.lang.Thread

activeCount, checkAccess, clone, countStackFrames, currentThread, destroy, dumpStack, enumerate, getAllStackTraces, getContextClassLoader, getDefaultUncaughtExceptionHandler, getId, getName, getPriority, getStackTrace, getState, getThreadGroup, getUncaughtExceptionHandler, holdsLock, interrupt, interrupted, isAlive, isDaemon, isInterrupted, join, join, join, resume, setContextClassLoader, setDaemon, setDefaultUncaughtExceptionHandler, setName, setPriority, setUncaughtExceptionHandler, sleep, sleep, start, stop, stop, suspend, toString, yield

Methods inherited from class java.lang.Object

equals, getClass, hashCode, notify, notifyAll, wait, wait, wait

Field Detail

CONNECT_STYLE_HTTP

```
public static final int CONNECT_STYLE_HTTP
```

See Also:

Constant Field Values

CONNECT_STYLE_SOCKET

```
public static final int CONNECT_STYLE_SOCKET
```

See Also:

Constant Field Values

Constructor Detail

CamStream

```
public CamStream(java.net.URL strm,
         java.lang.String app,
         java.net.URL docBase,
         int retryCount,
         int retryDelay,
         java.util.logging.Logger logger,
         boolean debug)
```

Method Detail

finalize

```
public void finalize()
              throws java.lang.Throwable
```

throws java.lang.Throwable

Overrides:

finalize in class java.lang.Object

Throws:

java.lang.Throwable

getCurrent

```
public java.awt.image.BufferedImage getCurrent()
```

getFPS

```
public double getFPS()
```

getIndex

```
public int getIndex()
```

getStreamURL

```
public java.net.URL getStreamURL()
```

getType

```
public java.lang.String getType()
```

run

```
public void run()
```

Specified by:

run in interface java.lang.Runnable

Overrides:

run in class java.lang.Thread

unhook

```
public void unhook()
```

Uses of Class com.charliemouse.cambozola.shared.Base64

No usage of com.charliemouse.cambozola.shared.Base64

Uses of Class com.charliemouse.cambozola.shared.CamStream

No usage of com.charliemouse.cambozola.shared.Camh tream

Uses of Class com.charliemouse.cambozola.shared.SzreamSpliz

No usage of com.charliemouse.cambozola.shared.h treamh plit

Hierarchy For Package com.charliemouse.cambozola.shared

Package Hierarchies:
All Packages

Class Hierarchy

- java.lang.Object
  - com.charliemouse.cambozola.shared.Base64
  - com.charliemouse.cambozola.shared.StreamSplit
  - java.lang.Thread (implements java.lang.Runnable)
    - com.charliemouse.cambozola.shared.CamStream

Package com.charliemouse.cambozola.shared

Class Summary

Class	Description
Base64	com/charliemouse/cambozola/shared/CamStream.java Copyright (C) Andy Wilcock, 2001.
CamStream	com/charliemouse/cambozola/shared/CamStream.java Copyright (C) Andy Wilcock, 2001.
StreamSplit	com/charliemouse/cambozola/shared/CamStream.java Copyright (C) Andy Wilcock, 2001.

com.charliemouse.cambozola.shared

Classes

Base64
CamStream
StreamSplit

com.charliemouse.cambozola.shared

Class StreamSplit

java.lang.Object
  com.charliemouse.cambozola.shared.StreamSplit

```
public class StreamSplit
extends java.lang.Object
```

com/charliemouse/cambozola/shared/CamStream.java
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See Also:

CamStream for more information.

Field Summary

Fields

Modifier and Type	Field and Description
static java.lang.String	BOUNDARY_MARKER_PREFIX
static java.lang.String	BOUNDARY_MARKER_TERM
protected java.io.DataInputStream	m_dis

Constructor Summary

Constructors

Constructor and Description
StreamSplit(java.io.DataInputStream dis)

Method Summary

Methods

Modifier and Type	Method and Description
protected static void	addPropValue(java.lang.String response, java.util.Hashtable ht)
java.io.InputStream	getStreamToReadToBoundary(java.lang.String boundary)
boolean	isAtStreamEnd()
java.util.Hashtable	readHeaders()
static java.util.Hashtable	readHeaders(java.net.URLConnection conn)
void	skipToBoundary(java.lang.String boundary)

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Field Detail

BOUNDARY_MARKER_PREFIX

```
public static final java.lang.String BOUNDARY_MARKER_PREFIX
```

See Also:

Constant Field V alues

BOUNDARY_MARKER_TERM

```
public static final java.lang.String BOUNDARY_MARKER_TERM
```

See Also:

Constant Field V alues

m_dis

```
protected java.io.DataInputStream m_dis
```

Constructor Detail

StreamSplit

```
public StreamSplit(java.io.DataInputStream dis)
```

Method Detail

readHeaders

```
public java.util.Hashtable readHeaders()
                                throws java.io.IOException
```

Throws:

`java.io.IOException`

addPropValue

```
protected static void addPropValue(java.lang.String response,
                java.util.Hashtable ht)
```

readHeaders

```
public static java.util.Hashtable readHeaders(java.net.URLConnection conn)
```

skipToBoundary

```
public void skipToBoundary(java.lang.String boundary)
                    throws java.io.IOException
```

Throws:

`java.io.IOException`

getStreamToReadToBoundary

```
public java.io.InputStream getStreamToReadToBoundary(java.lang.String boundary)
                                              throws java.io.IOException
```

Throws:

java.io.IOException

isAtStreamEnd

```
public boolean isAtStreamEnd()
```

Uses of Package com.charliemouse.cambozola.shared

No usage of com.charliemouse.cambozola.shared

com._604robotics.robot2012.vision.config

Class LinkedSlider.DoubleLinkedSlider

java.lang.Object
  java.awt.Component
    java.awt.Container
      javax.swing.JComponent
        javax.swing.Box
          com._604robotics.robot2012.vision.config.LinkedSlider
            com._604robotics.robot2012.vision.config.LinkedSlider.DoubleLinkedSlider

All Implemented Interfaces:

java.awt.image.ImageObserver, java.awt.MenuContainer, java.io.Serializable, java.util.EventListener, javax.accessibility.Accessible,
javax.swing.event.ChangeListener

Direct Known Subclasses:

LinkedSlider.ExponentialLinkedSlider

Enclosing class:

LinkedSlider

```
public static class LinkedSlider.DoubleLinkedSlider
extends LinkedSlider
```

A LinkedSlider that can be set to floating-point values

See Also:

Serialized Form

Nested Class Summary

Nested classes/interfaces inherited from class com._604robotics.robot2012.vision.config.LinkedSlider

LinkedSlider.DoubleLinkedSlider, LinkedSlider.ExponentialLinkedSlider, LinkedSlider.IntLinkedSlider

Nested classes/interfaces inherited from class javax.swing.Box

javax.swing.Box.AccessibleBox, javax.swing.Box.Filler

Nested classes/interfaces inherited from class javax.swing.JComponent

javax.swing.JComponent.AccessibleJComponent

Nested classes/interfaces inherited from class java.awt.Container

java.awt.Container.AccessibleAWTContainer

Nested classes/interfaces inherited from class java.awt.Component

java.awt.Component.AccessibleAWTComponent, java.awt.Component.BaselineResizeBehavior,
java.awt.Component.BltBufferStrategy, java.awt.Component.FlipBufferStrategy

Field Summary

Fields inherited from class com._604robotics.robot2012.vision.config.LinkedSlider

max, min, mul, slider

Fields inherited from class javax.swing.JComponent

accessibleContext, listenerList, TOOL_TIP_TEXT_KEY, ui, UNDEFINED_CONDITION, WHEN_ANCESTOR_OF_FOCUSED_COMPONENT,
WHEN_FOCUSED, WHEN_IN_FOCUSED_WINDOW

Fields inherited from class java.awt.Component

BOTTOM_ALIGNMENT, CENTER_ALIGNMENT, LEFT_ALIGNMENT, RIGHT_ALIGNMENT, TOP_ALIGNMENT

Fields inherited from interface java.awt.image.ImageObserver

ABORT, ALLBITS, ERROR, FRAMEBITS, HEIGHT, PROPERTIES, SOMEBITS, WIDTH

Constructor Summary

Constructors

Constructor and Description
LinkedSlider.DoubleLinkedSlider(java.lang.String name, double initialValue, double max) A constructor for a DoubleLinkedSlider

Method Summary

Methods

Modifier and Type	Method and Description
double	**getValue**()
void	**setValue**(double val) A setter for the value of the slider

Methods inherited from class com._604robotics.robot2012.vision.config.LinkedSlider

getValText, stateChanged, updateValLabel

Methods inherited from class javax.swing.Box

createGlue, createHorizontalBox, createHorizontalGlue, createHorizontalStrut, createRigidArea, createVerticalBox, createVerticalGlue, createVerticalStrut, getAccessibleContext, paintComponent, setLayout

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBaseline, getBaselineResizeBehavior, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingForPrint, isPaintingOrigin, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getLayout, getMousePosition, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paintComponents, preferredSize, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, setComponentZOrder, setFocusCycleRoot, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, transferFocusDownCycle, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, bounds, checkImage, checkImage, coalesceEvents, contains, createImage, createImage, createVolatileImage

checkImage, checkImage, coalesceEvents, contains, createImage, createImage, createVolatileImage, createVolatileImage, disableEvents, dispatchEvent, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getBackground, getBounds, getColorModel, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeysEnabled, getFont, getForeground, getGraphicsConfiguration, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getLocale, getLocation, getLocationOnScreen, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getToolkit, getTreeLock, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, isBackgroundSet, isCursorSet, isDisplayable, isEnabled, isFocusable, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, list, list, list, location, lostFocus, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paintAll, postEvent, prepareImage, prepareImage, processComponentEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, resize, resize, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setFocusable, setFocusTraversalKeysEnabled, setIgnoreRepaint, setLocale, setLocation, setLocation, setName, setSize, setSize, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait

Constructor Detail

LinkedSlider.DoubleLinkedSlider

```
public LinkedSlider.DoubleLinkedSlider(java.lang.String name,
                                       double initialValue,
                                       double max)
```

A constructor for a DoubleLinkedSlider

Parameters:

`name` - The name of the slider

`initialValue` - The initial value

`max` - The maximum value that this slider can be at

Method Detail

getValue

```
public double getValue()
```

Specified by:

`getValue` in class `LinkedSlider`

Returns:

The current value

setValue

```
public void setValue(double val)
```

Description copied from class: `LinkedSlider`
A setter for the value of the slider

Specified by:

`setValue` in class `LinkedSlider`

Parameters:

`val` - the value to set the slider to

Uses of Class com._604robotics.robot2012.vision.config.LinkedSlider.DoubleLinkedSlider

Packages that use LinkedSlider.DoubleLinkedSlider

Package	Description
com._604robotics.robot2012.vision.config	

Uses of LinkedSlider.DoubleLinkedSlider in com._604robotics.robot2012.vision.config

Subclasses of LinkedSlider.DoubleLinkedSlider in com._604robotics.robot2012.vision.config

Modifier and Type	Class and Description
static class	**LinkedSlider.ExponentialLinkedSlider** A LinkedSlider that has an exponential scale, so it is much easier to pick small values (close to zero) while still allowing a range up to 1

Uses of Class com._604robotics.robot2012.vision.config.LinkedSlider

Packages that use LinkedSlider

Package	Description
com._604robotics.robot2012.vision.config	

Uses of LinkedSlider in com._604robotics.robot2012.vision.config

Subclasses of LinkedSlider in com._604robotics.robot2012.vision.config

Modifier and Type	Class and Description
static class	**LinkedSlider.DoubleLinkedSlider** A LinkedSlider that can be set to floating-point values
static class	**LinkedSlider.ExponentialLinkedSlider** A LinkedSlider that has an exponential scale, so it is much easier to pick small values (close to zero) while still allowing a range up to 1
static class	**LinkedSlider.IntLinkedSlider** A LinkedSlider that can only be set to integers

Uses of Class com._604robotics.robot2012.vision.config.Configger

No usage of com._604robotics.robot2012.vision.config.Configger

Uses of Class com._604robotics.robot2012.vision.config.Config

Packages that use Config

Package	Description
com._604robotics.robot2012.vision	
com._604robotics.robot2012.vision.config	

Uses of Config in com._604robotics.robot2012.vision

Fields in com._604robotics.robot2012.vision declared as Config

Modifier and Type	Field and Description
Config	**VisionProcessing.conf** The Configuration file for this VisionProcessing

Uses of Config in com._604robotics.robot2012.vision.config

Methods in com._604robotics.robot2012.vision.config that return Config

Modifier and Type	Method and Description
static Config	**Config.readConfig**(java.io.File file) Read a Config from a file
static Config	**Config.readDefaultConfig**() Reads the default Config file

Uses of Class com._604robotics.robot2012.vision.config.LinkedSlider.IntLinkedSlider

No usage of com._604robotics.robot2012.vision.config.) inkedb lider rt) inkedb lider

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Prev Next Frames No Frames All Classes

Uses of Class com._604robotics.robot2012.vision.config.LinkedSlider.E popentialLinkedSlider

No usage of com._604robotics.robot2012.vision.config.) inkedb lidexpponential) inkedb lider

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Class LinkedSlider

) avah langh OQ) ect
) avah awth Component
) avah awth Container
) avaxh swingh 0 Component
) avaxh swingh , ox
comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h visionSlidercnz igh f inked

All Implemented Interfaces:

Bava awt.image.ImageOb serverf Bava awt.2 enContainerf Bava io.Seriali) ab lef Bava z ventz istenerf Bava accessib ilyAccessib lef Bava xswing.event.C* angef istener

Direct Known Subclasses:

f inkedSlider.Doub lez inkedSlider fer inkedSlider ntz inkedSlider

---

```
public abstract class LinkedSlider
extends javax.swing.Box
implements javax.swing.event.ChangeListener
```

A - Slider*t at displays its current position and name in - z ab els next to it

See Also:

Seriali) ed Form

Nested Class Summary

Nested Classes

Modifier and Type	Class and Description
static class	**LinkedSlider.DoubleLinkedSlider** A z inkedSlider*t at can Q e set to z loating" pointvalu
static class	**LinkedSlider.ExponentialLinkedSlider** A z inkedSlider*t at * as an exponential scalef so it is much easier to pick small values - close to) ero-* while still allowing a range up to 1
static class	**LinkedSlider.IntLinkedSlider** A z inkedSlider*t at can only b e set to integers

Nested classes/interfaces inherited from class javax.swing.Box

javax.swing.Box.AccessibleBox, javax.swing.Box.Filler

Nested classes/interfaces inherited from class javax.swing.JComponent

javax.swing.JComponent.AccessibleJComponent

Nested classes/interfaces inherited from class java.awt.Container

java.awt.Container.AccessibleAWTContainer

Nested classes/interfaces inherited from class java.awt.Component

java.awt.Component.AccessibleAWTComponent, java.awt.Component.BaselineResizeBehavior, java.awt.Component.BltBufferStrategy, java.awt.Component.FlipBufferStrategy

Field Summary

Fields

Modifier and Type	Field and Description
protected int	**max** T* e maximum value on the slider - must b e an integer-
protected int	**min** T* e minimum value on the slider - must b e an integer-

protected double	**mul** A numb er to multiply all slider outputs by
javax.swing.JSlider	**slider** The slider that the user interacts with

Fields inherited from class javax.swing.JComponent

accessibleContext, listenerList, TOOL_TIP_TEXT_KEY, ui, UNDEFINED_CONDITION, WHEN_ANCESTOR_OF_FOCUSED_COMPONENT, WHEN_FOCUSED, WHEN_IN_FOCUSED_WINDOW

Fields inherited from class java.awt.Component

BOTTOM_ALIGNMENT, CENTER_ALIGNMENT, LEFT_ALIGNMENT, RIGHT_ALIGNMENT, TOP_ALIGNMENT

Fields inherited from interface java.awt.image.ImageObserver

ABORT, ALLBITS, ERROR, FRAMEBITS, HEIGHT, PROPERTIES, SOMEBITS, WIDTH

Constructor Summary

Constructors

Constructor and Description
LinkedSlider(java.lang.String name, int min, int max, int val) A constructor j or a z inkedSlider

Method Summary

Methods

Modifier and Type	Method and Description
java.lang.String	**getValText**() T* is met* od returns a human-readab le j ormatted umb er sited j or*t e type oj z inkedSlider
abstract double	**getValue**()
abstract void	**setValue**(double val) A setter j or*t e vale oj *t e slider
void	**stateChanged**(javax.swing.event.ChangeEvent e)
protected void	**updateValLabel**() T* is met* od updates the lab el on*t e rig* t side t* at displays the current value

Methods inherited from class javax.swing.Box

createGlue, createHorizontalBox, createHorizontalGlue, createHorizontalStrut, createRigidArea, createVerticalBox, createVerticalGlue, createVerticalStrut, getAccessibleContext, paintComponent, setLayout

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBaseline, getBaselineResizeBehavior, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingForPrint, isPaintingOrigin, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addPropertyChangeListener, addPropertyChangeListener,

applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getLayout, getMousePosition, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paintComponents, preferredSize, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, setComponentZOrder, setFocusCycleRoot, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, transferFocusDownCycle, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, bounds, checkImage, checkImage, coalesceEvents, contains, createImage, createImage, createVolatileImage, createVolatileImage, disableEvents, dispatchEvent, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getBackground, getBounds, getColorModel, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeysEnabled, getFont, getForeground, getGraphicsConfiguration, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getLocale, getLocation, getLocationOnScreen, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getToolkit, getTreeLock, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, isBackgroundSet, isCursorSet, isDisplayable, isEnabled, isFocusable, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, list, list, list, location, lostFocus, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paintAll, postEvent, prepareImage, prepareImage, processComponentEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, resize, resize, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setFocusable, setFocusTraversalKeysEnabled, setIgnoreRepaint, setLocale, setLocation, setLocation, setName, setSize, setSize, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait

Field Detail

slider

```
public javax.swing.JSlider slider
```

T* e slider t* at t*user interacts with

min

```
protected int min
```

The minimum value on the slider - must b e an integer-

max

```
protected int max
```

T* e maximum value on the slider - must b e an integer-

mul

```
protected double mul
```

A numb er to multiply all slider outputs by

Constructor Detail

LinkedSlider

```
public LinkedSlider(java.lang.String name,
            int min,
            int max,
            int val)
```

A constructor j or a z inkedSlider

Parameters:

`name`) T e name oz t* e slider

`min` " T* e minimum value

`max` - T* e maximum value

`val` - T* e initial value

Method Detail

setValue

```
public abstract void setValue(double val)
```

A setter j or*t e value oj *t e slider

Parameters:

`val` " t* e value to set the slider to

stateChanged

```
public void stateChanged(javax.swing.event.ChangeEvent e)
```

Specified by:

`stateChanged` in interj ace `javax.swing.event.ChangeListener`

updateValLabel

```
protected void updateValLabel()
```

T* is met* od updates the lab el on *t e rig* t side t* at displays the current value

getValText

```
public java.lang.String getValText()
```

This method returns a human-readab le j ormatted umb er sited j or*t eype oj z inkedSlider It is used to show the current value on the slider

Returns:

The string that is shown in the - z ab el* to *t e rig* t oz t* e slider

getValue

```
public abstract double getValue()
```

Returns:

T* e current value

com.u R 0 4 roQ oticsh roQ ot2 0 1 2 h visionh conz ig

Class Configger

) avah langh OQ) ect
comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h visionh conz igh Conz igger

---

```
public class Configger
extends java.lang.Object
```

T* is class creates a window z or conzrig ng various aspects oj *t e 0 ision program,uch as target colorf target sensitivijf and ot er valles j und in Config.

The name oj *t is class is oz z igyial Conj iggerz f a common mispronunciation oj *t e word f Conzrig". It comes j rom nonijying the verb j orm oj e s* ortened word f Conz igf h

Constructor Summary

Constructors

Constructor and Description
Configger() T* is constructor oj *t e Conz igger initialif es eyth ng and sets the Conj igger as visib .le

Method Summary

Methods

Modifier and Type	Method and Description
static javax.swing.Box	**boxForTextField**(javax.swing.JTextField textField, java.lang.String name) A simple utility method that creates a Bavaxswing.) ox*t at * olds a laQ el indicating t* e name oz t* e variaQ c* ange and a text z ield z or t*ser to type input into.
static void	**main**(java.lang.String[] args) A simple mainz) m*etod to make t* e Conz iggerunnab le program

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

Configger

```
public Configger()
```

T* is constructor oj *t e Conz igger initialif es eyth ng and sets the Conj igger as visib .le

Method Detail

main

```
public static void main(java.lang.String[] args)
```

A simple mainz) m*etod to make t* e Conz iggerunnab le program

boxForTextField

```
public static javax.swing.Box boxForTextField(javax.swing.JTextField textField,
                                              java.lang.String name)
```

A simple utility method that creates a Bavaxswing.) ox*t at * olds a laQ el indicating t* e name oz t* e variaQ ange and a text z ield z or t*ser to type input into.

Parameters:

`textField` - T e (TextField t* user can type into

`name` - T e name oz t* e use to change z s own in a ( ) aQ el"

Returns:

a 8 ox containing t* e ( ) aQ el and (TextField

Hierarchy For Package com._604robotics.robot2012.vision.config

Package Hierarchies:
All Packages

Class Hierarchy

- java.lang.Object
  - java.awt.Component (implements java.awt.image.ImageObserver, java.awt.MenuContainer, java.io.Serializable)
    - java.awt.Container
      - javax.swing.JComponent (implements java.io.Serializable)
        - javax.swing.Box (implements javax.accessibility.Accessible)
          - com._604robotics.robot2012.vision.config.**LinkedSlider** (implements javax.swing.event.ChangeListener)
            - com._604robotics.robot2012.vision.config.**LinkedSlider.DoubleLinkedSlider**
              - com._604robotics.robot2012.vision.config.**LinkedSlider.ExponentialLinkedSlider**
            - com._604robotics.robot2012.vision.config.**LinkedSlider.IntLinkedSlider**
  - com._604robotics.robot2012.vision.config.**Config**
  - com._604robotics.robot2012.vision.config.**Configger**

Package com._604robotics.robot2012.vision.config

Class Summary

Class	Description
Config	The configuration of the Team 604 FRCVision
Configger	This class creates a window for configuring various aspects of the Vision program, such as target color, target sensitivity, and other values found in `Config`.
LinkedSlider	A JSlider that displays its current position and name in JLabels next to it
LinkedSlider.DoubleLinkedSlider	A LinkedSlider that can be set to floating-point values
LinkedSlider.ExponentialLinkedSlider	A LinkedSlider that has an exponential scale, so it is much easier to pick small values (close to zero) while still allowing a range up to 1
LinkedSlider.IntLinkedSlider	A LinkedSlider that can only be set to integers

com._604robotics.robot2012.vision.config

Classes

Config
Configger
LinkedSlider
LinkedSlider.DoubleLinkedSlider
LinkedSlider.ExponentialLinkedSlider
LinkedSlider.IntLinkedSlider

com._604robotics.robot2012.vision.config

Class Config

java.lang.Object
    com._604robotics.robot2012.vision.config.Config

```
public class Config
extends java.lang.Object
```

The configuration of the Team 604 FRCVision

Field Summary

Fields

Modifier and Type	Field and Description
boolean	**checkCenter** Should the tiling algorithm check the center of the tile, as well as the corners to determine if it should be considered for being in the target?
double	**color_mulB** How much to multiply the square of the errors per color channel by
double	**color_mulG** How much to multiply the square of the errors per color channel by
double	**color_mulR** How much to multiply the square of the errors per color channel by
int	**color_targetB** The color of the vision target when the light is shining on it
int	**color_targetG** The color of the vision target when the light is shining on it
int	**color_targetR** The color of the vision target when the light is shining on it
boolean	**communicateToRobot** Should this program attempt to communicate to the robot?
boolean	**debug_Print** Should debug info be shown? This includes time per frame, number of visible targets, and estimated position of visible targets.
boolean	**debug_SaveImagesToFiles** Should camera images be stored onto disk, for debug purposes?
boolean	**debug_ShowDisplay** Should the fancy display be shown, with green and red tiles indicating matching and non-matching tiles, with blue lines and dots indicating target sides and corners?
int	**minBlobSize** A calibration constant indicating the minimum size for a potential target to be considered.
boolean	**scanWholeTile** Should all pixels be scanned in every tile be scanned, or just the corners (and possibly center)
byte	**sensitivity** A constant between -128 to +127 indicating how sensitive the color acceptance of the target should be.
int	**tileSize** The size of each tile in the vision processing.

Constructor Summary

Constructors

Constructor and Description
Config()

Method Summary

Methods

Modifier and Type	Method and Description

static **Config**	**readConfig**(java.io.File file) - eada Conj ig om a j ile
static **Config**	**readDefaultConfig**() - eads* edej alt Config file
void	**save**(java.io.File file) Saves this Config to a given file
void	**saveDefaultConfig**() Saves this Config to the default file
java.lang.String	**toString**()

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait

Field Detail

checkCenter

```
public boolean checkCenter
```

Should the tiling algorithm check the center of the tile, as well as the corners to determine if it should be considered for being in the target?

communicateToRobot

```
public boolean communicateToRobot
```

Should this program attempt to communicate to the robot?

debug_Print

```
public boolean debug_Print
```

Should debug info be shown? This includes time per frame, number of visible targets, and estimated position of visible targets.

debug_SaveImagesToFiles

```
public boolean debug_SaveImagesToFiles
```

Should camera images be stored onto disk, for debug purposes?

debug_ShowDisplay

```
public boolean debug_ShowDisplay
```

Should the fancy display be shown, with green and red tiles indicating matching and non-matching tiles, with blue lines and dots indicating target sides and corners?

minBlobSize

```
public int minBlobSize
```

A calibration constant indicating the minimum size for a potential target to be considered. This number is given in square "tiles", with `tileSize` pixels side lengths

scanWholeTile

```
public boolean scanWholeTile
```

Should all pixels be scanned in every tile be scanned, or just the corners (and possibly center)

sensitivity

```
public byte sensitivity
```

A constant between -128 to +127 indicating how sensitive the color acceptance of the target should be. Lower numbers will allow more pixels, while higher numbers will eliminate more.
This number needs to be chosen high enough to reduce or eliminate false positives, but it needs to be low enough to not generate false negatives.

tileSize

tileSize

```
public int tileSize
```

The size of the square tile in the vision processing. This is represented in pixels. It should be a number chosen large enough to have a good speed, but small enough to not miss a target in the image.

color_targetR

```
public int color_targetR
```

The color of the vision target when the light is shining on it

color_targetG

```
public int color_targetG
```

The color of the vision target when the light is shining on it

color_targetB

```
public int color_targetB
```

The color of the vision target when the light is shining on it

color_mulR

```
public double color_mulR
```

How much to multiply the square of the errors per color channel by

color_mulG

```
public double color_mulG
```

How much to multiply the square of the errors per color channel by

color_mulB

```
public double color_mulB
```

How much to multiply the square of the errors per color channel by

Constructor Detail

Config

```
public Config()
```

Method Detail

readDefaultConfig

```
public static Config readDefaultConfig()
```

Reads the default Config file

Returns:

the Config, as read from vision.conf

saveDefaultConfig

```
public void saveDefaultConfig()
                     throws java.io.IOException
```

Saves this Config to the default file

Throws:

java.io.IOException - If an error occurs

java.io.IOException - If an error occurs

readConfig

```
public static Config readConfig(java.io.File file)
```

Read a Config from a file

Parameters:

`file` - the file to read it from

Returns:

the Config read from the file

save

```
public void save(java.io.File file)
          throws java.io.IOException
```

Saves this Config to a given file

Parameters:

`file` - The file to save to

Throws:

`java.io.IOException` - If an error occurs

toString

```
public java.lang.String toString()
```

Overrides:

`toString` in class `java.lang.Object`

com.u R 0o4otics.robot2) 1vis2ion.conj ig

Class LinkedSlider.IntLinkedSlider

B ava1ang.Ob B ect
  B ava awt.Component
    B ava awt.Container
      B ava xswing.- Component
        B ava xswing.f ox
          com.u R 0o4otics.robot2) 1vis2ion.conj ig.z inkedSlider
            com.u R 0o4otics.robot2) 1vis2ion.conj ig.z inkedSlider.Intz inkedSlider

All Implemented Interfaces:

B ava awt.image.ImageOb server B ava awt.MenuContainer f B ava io.Seriali) ab le B ava util.- vent istener B ava xaccessib ility.Accessible f
B ava xswing.event.C* angef istener

Enclosing class:

f inkedSlider

```
public static class LinkedSlider.IntLinkedSlider
extends LinkedSlider
```

A z inkedSlider* a can only b e set to integers

See Also:

Seriali) ed Form

Nested Class Summary

Nested classes/interfaces inherited from class com._604robotics.robot2012.vision.config.LinkedSlider

LinkedSlider.DoubleLinkedSlider, LinkedSlider.ExponentialLinkedSlider, LinkedSlider.IntLinkedSlider

Nested classes/interfaces inherited from class javax.swing.Box

javax.swing.Box.AccessibleBox, javax.swing.Box.Filler

Nested classes/interfaces inherited from class javax.swing.JComponent

javax.swing.JComponent.AccessibleJComponent

Nested classes/interfaces inherited from class java.awt.Container

java.awt.Container.AccessibleAWTContainer

Nested classes/interfaces inherited from class java.awt.Component

java.awt.Component.AccessibleAWTComponent, java.awt.Component.BaselineResizeBehavior,
java.awt.Component.BltBufferStrategy, java.awt.Component.FlipBufferStrategy

Field Summary

Fields inherited from class com._604robotics.robot2012.vision.config.LinkedSlider

max, min, mul, slider

Fields inherited from class javax.swing.JComponent

accessibleContext, listenerList, TOOL_TIP_TEXT_KEY, ui, UNDEFINED_CONDITION, WHEN_ANCESTOR_OF_FOCUSED_COMPONENT,
WHEN_FOCUSED, WHEN_IN_FOCUSED_WINDOW

Fields inherited from class java.awt.Component

BOTTOM_ALIGNMENT, CENTER_ALIGNMENT, LEFT_ALIGNMENT, RIGHT_ALIGNMENT, TOP_ALIGNMENT

Fields inherited from interface java.awt.image.ImageObserver

ABORT, ALLBITS, ERROR, FRAMEBITS, HEIGHT, PROPERTIES, SOMEBITS, WIDTH

Constructor Summary

Constructors

Constructor and Description
LinkedSlider.IntLinkedSlider(java.lang.String name, int min, int max, int val) A constructor

Method Summary

Methods

Modifier and Type	Method and Description
int	**getIntValue**() Returns the value of the slider as an int
java.lang.String	**getValText**() Returns a human readable, formatted result of type LinkedSlider
double	**getValue**() Returns the value of the slider
void	**setValue**(double val) A setter for the value of the slider

Methods inherited from class com._604robotics.robot2012.vision.config.LinkedSlider

stateChanged, updateValLabel

Methods inherited from class javax.swing.Box

createGlue, createHorizontalBox, createHorizontalGlue, createHorizontalStrut, createRigidArea, createVerticalBox, createVerticalGlue, createVerticalStrut, getAccessibleContext, paintComponent, setLayout

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBaseline, getBaselineResizeBehavior, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingForPrint, isPaintingOrigin, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getLayout, getMousePosition, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paintComponents, preferredSize, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, setComponentZOrder, setFocusCycleRoot, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, transferFocusDownCycle, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, bounds,

checkImage, checkImage, coalesceEvents, contains, createImage, createImage, createVolatileImage, createVolatileImage, disableEvents, dispatchEvent, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getBackground, getBounds, getColorModel, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeysEnabled, getFont, getForeground, getGraphicsConfiguration, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getLocale, getLocation, getLocationOnScreen, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getToolkit, getTreeLock, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, isBackgroundSet, isCursorSet, isDisplayable, isEnabled, isFocusable, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, list, list, list, location, lostFocus, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paintAll, postEvent, prepareImage, prepareImage, processComponentEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, resize, resize, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setFocusable, setFocusTraversalKeysEnabled, setIgnoreRepaint, setLocale, setLocation, setLocation, setName, setSize, setSize, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait

Constructor Detail

LinkedSlider.IntLinkedSlider

```
public LinkedSlider.IntLinkedSlider(java.lang.String name,
                                    int min,
                                    int max,
                                    int val)
```

A constructor

Parameters:

`name` - The name of the slider

`min` - The minimum value

`max` - The maximum value

`val` - The initial value

Method Detail

getIntValue

```
public int getIntValue()
```

Returns:

the current value

getValue

```
public double getValue()
```

Specified by:

`getValue` in class `LinkedSlider`

Returns:

The current value

getValText

```
public java.lang.String getValText()
```

Description copied from class: LinkedSlider

This method returns a "human" readable formatted number suited for the type of LinkedSlider. It is used to show the current value on the slider

Overrides:

`getValText` in class `LinkedSlider`

Returns:

T* string t* ats s* own in t* e z abtœt* rig* bj t* slider

setValue

```
public void setValue(double val)
```

Description copied from class: `LinkedSlider`
A setter jor t* value oj t* slider

Specified by:

`setValue` in class `LinkedSlider`

Parameters:

`val` " *t value to set t* slider to

Uses of Package com._604robotics.robot2012.vision.config

Packages that use com._604robotics.robot2012.vision.config

Package	Description
com._604robotics.robot2012.vision	
com._604robotics.robot2012.vision.config	

Classes in com._604robotics.robot2012.vision.config used by com._604robotics.robot2012.vision

Class and Description
Config The configuration of the Team 604 FRCVision

Classes in com._604robotics.robot2012.vision.config used by com._604robotics.robot2012.vision.config

Class and Description
Config The configuration of the Team 604 FRCVision
LinkedSlider A u R lider that displa0 s its current position and naime u 4 aQ els next to it
LinkedSlider.DoubleLinkedSlider A 4 inkedR lider that can Q e set to floating2 poinutes a

comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h visionh conz ig

Class LinkedSlider.ExponentialLinkedSlider

) avah langh OQ) ect
) avah awth Component
) avah awth Container
) avaxh swingh 0 Component
) avaxh swingh , ox
comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h visionSlider conz igh f inked
com.u R 0 4 roQ oticsh roQ ot2 0 1 2 h visionSlider conZ igh f inkedSlider
com.u R 0 4 roQ oticsh roQ ot2 0 1 2 h visionSlider conZ igh f inkedSlider

All Implemented Interfaces:

B avaawt.image.ImageOb server) B awt.MenuContainerY B avaio.Serializ ab le) B avaawt.event.Ac vent istener) B avaxaccessib ilityAccessibleY
B avaxswing.event.C* angef istener

Enclosing class:

f inkedSlider

```
public static class LinkedSlider.ExponentialLinkedSlider
extends LinkedSlider.DoubleLinkedSlider
```

A z inkedSlider*t at * as an exponential scale8 so it isch easier to pick small values " dse to - erLw* ile still allowing a rangeup to 1

See Also:

Serializ ed Form

Nested Class Summary

Nested classes/interfaces inherited from class com._604robotics.robot2012.vision.config.LinkedSlider

LinkedSlider.DoubleLinkedSlider, LinkedSlider.ExponentialLinkedSlider, LinkedSlider.IntLinkedSlider

Nested classes/interfaces inherited from class javax.swing.Box

javax.swing.Box.AccessibleBox, javax.swing.Box.Filler

Nested classes/interfaces inherited from class javax.swing.JComponent

javax.swing.JComponent.AccessibleJComponent

Nested classes/interfaces inherited from class java.awt.Container

java.awt.Container.AccessibleAWTContainer

Nested classes/interfaces inherited from class java.awt.Component

java.awt.Component.AccessibleAWTComponent, java.awt.Component.BaselineResizeBehavior,
java.awt.Component.BltBufferStrategy, java.awt.Component.FlipBufferStrategy

Field Summary

Fields inherited from class com._604robotics.robot2012.vision.config.LinkedSlider

max, min, mul, slider

Fields inherited from class javax.swing.JComponent

accessibleContext, listenerList, TOOL_TIP_TEXT_KEY, ui, UNDEFINED_CONDITION, WHEN_ANCESTOR_OF_FOCUSED_COMPONENT,
WHEN_FOCUSED, WHEN_IN_FOCUSED_WINDOW

Fields inherited from class java.awt.Component

BOTTOM ALIGNMENT, CENTER ALIGNMENT, LEFT ALIGNMENT, RIGHT ALIGNMENT, TOP ALIGNMENT

Fields inherited from interface java.awt.image.ImageObserver

ABORT, ALLBITS, ERROR, FRAMEBITS, HEIGHT, PROPERTIES, SOMEBITS, WIDTH

Constructor Summary

Constructors

Constructor and Description
LinkedSlider.ExponentialLinkedSlider(java.lang.String name, double initial) A constructor to make an f xponentialz inkedSlider
LinkedSlider.ExponentialLinkedSlider(java.lang.String name, double initial, double max) A constructor to make an f xponentialz inkedSlider

Method Summary

Methods

Modifier and Type	Method and Description
double	**getValue**()
void	**setValue**(double val) A setter j or*t e vale oj *t e slider

Methods inherited from class com._604robotics.robot2012.vision.config.LinkedSlider

getValText, stateChanged, updateValLabel

Methods inherited from class javax.swing.Box

createGlue, createHorizontalBox, createHorizontalGlue, createHorizontalStrut, createRigidArea, createVerticalBox, createVerticalGlue, createVerticalStrut, getAccessibleContext, paintComponent, setLayout

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeV sibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBaseline, getBaselineResizeBehavior, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getUIClassID, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getV sibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingForPrint, isPaintingOrigin, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paint, paintBorder, paintChildren, paintImmediately, paintImmediately, paramString, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToV sible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setV sible, unregisterKeyboardAction, update, updateUI

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getLayout, getMousePosition, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paintComponents, preferredSize, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, setComponentZOrder, setFocusCycleRoot, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, transferFocusDownCycle, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, bounds, checkImage, checkImage, coalesceEvents, contains, createImage, createImage, createV olatileImage

checkImage, checkImage, coalesceEvents, contains, createImage, createImage, createVolatileImage, createVolatileImage, disableEvents, dispatchEvent, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getBackground, getBounds, getColorModel, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeysEnabled, getFont, getForeground, getGraphicsConfiguration, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getLocale, getLocation, getLocationOnScreen, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getToolkit, getTreeLock, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, isBackgroundSet, isCursorSet, isDisplayable, isEnabled, isFocusable, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, list, list, list, location, lostFocus, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paintAll, postEvent, prepareImage, prepareImage, processComponentEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, resize, resize, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setFocusable, setFocusTraversalKeysEnabled, setIgnoreRepaint, setLocale, setLocation, setLocation, setName, setSize, setSize, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait

Constructor Detail

LinkedSlider.ExponentialLinkedSlider

```
public LinkedSlider.ExponentialLinkedSlider(java.lang.String name,
                                            double initial,
                                            double max)
```

A constructor to make an ExponentialLinkedSlider

Parameters:

`name` - The name of the slider

`initial` - The initial value

`max` - The maximum value

LinkedSlider.ExponentialLinkedSlider

```
public LinkedSlider.ExponentialLinkedSlider(java.lang.String name,
                                            double initial)
```

A constructor to make an ExponentialLinkedSlider. A default max of 1 is assumed.

Parameters:

`name` - The name of the slider

`initial` - The initial value of the slider

Method Detail

getValue

```
public double getValue()
```

Overrides:

`getValue` in class `LinkedSlider.DoubleLinkedSlider`

Returns:

The current value

setValue

```
public void setValue(double val)
```

Description copied from class: LinkedSlider

A setter z or t* e vœe oj *t e slider

Overrides:

`setValue` in class `LinkedSlider.DoubleLinkedSlider`

Parameters:

`val` (t* e vœe to set t* e slider to

comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h vision

Class LinearRegression.RegressionResult

z avah langh OQ z ect
comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h visionh) 0ineqr0ssiqn0ssitdh

Direct Known Subclasses:

B inear- egressidn ackwards- egression- uts

Enclosing class:

B inear- egression

```
public static class LinearRegression.RegressionResult
extends java.lang.Object
```

A regression result t* at indicates t* e line t* at Q est matc* es a giveri sdatah

Constructor Summary

Constructors

Constructor and Description
`LinearRegression.RegressionResult(double m, double b, double r2)`

Method Summary

Methods

Modifier and Type	Method and Description
`java.lang.String`	`toString()`

Methods inherited from class java.lang.Object

`clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait`

Constructor Detail

LinearRegression.RegressionResult

```
public LinearRegression.RegressionResult(double m,
                                         double b,
                                         double r2)
```

Parameters:

`m` f T* e slope of t* e regression line

`b` f T* yf interceptof t* e regression line

`r2` f A numb er indicating* ow good of a f it t* is line is

Method Detail

toString

```
public java.lang.String toString()
```

Overrides:

`toString` in class `java.lang.Object`

comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h vision

Class Point3d

z avah langh OQ z ect
comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h visionh Point) d

```
public class Point3d
extends java.lang.Object
```

T* is represents a point in) d space

Field Summary

Fields

Modifier and Type	Field and Description
double	**x** T* e 0 vœe
double	**y** The Y value
double	**z** The z vale

Constructor Summary

Constructors

Constructor and Description
Point3d(double x, double y, double z)

Method Summary

Methods

Modifier and Type	Method and Description
double	**getX**()
double	**getY**()
double	**getZ**()
void	**setX**(double x) Sets t* e 0 vœe of t* is Point
void	**setY**(double y) Sets t* e , vœe of t* is Point
void	**setZ**(double z) Sets t* e f vœe of t* is Point

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Field Detail

x

```
public double x
```

T* e 0 vœe

y

y

```
public double y
```

T* e , vœ

z

```
public double z
```

The z valie

Constructor Detail

Point3d

```
public Point3d(double x,
       double y,
       double z)
```

Parameters:

x YT* e 0 vœ

y YT* e , vœ

z YT* e f vœ

Method Detail

getX

```
public double getX()
```

Returns:

The - valie

setX

```
public void setX(double x)
```

Sets t* e 0 vœ of t* is Point

Parameters:

x 8 T* e 0 uœ

getY

```
public double getY()
```

Returns:

The Y value

setY

```
public void setY(double y)
```

Sets t* e , vœ of t* is Point

Parameters:

y 8 T* e , uœ

getZ

```
public double getZ()
```

Returns:

T* e f vœd

setZ

```
public void setZ(double z)
```

Sets t* e f vœe of t* is Point

Parameters:

z 8 T* e f uœl

Uses of Class com._604robotics.robot2012.vision.LinearR gression.RegressionResult

Packages that use LinearRegression.RegressionResult

Package	Description
com._604robotics.robot2012.vision	

Uses of LinearRegression.RegressionResult in com._604robotics.robot2012.vision

Subclasses of LinearRegression.RegressionResult in com._604robotics.robot2012.vision

Modifier and Type	Class and Description
static class	**LinearRegression.BackwardsRegressionResult** A regression result that, instead of having y as a function of x has x as a function of y.

Methods in com._604robotics.robot2012.vision that return LinearRegression.RegressionResult

Modifier and Type	Method and Description
static LinearRegression.RegressionResult	**LinearRegression.getRegression**(double[] x, double[] y) This function computes the linear regression of a set of x and y values.
LinearRegression.RegressionResult	**VisionProcessing.getRegressionForSide**(ResultImage ri, int side, AABB guess) Get a line that best fits the sides of a given target

Methods in com._604robotics.robot2012.vision with parameters of type LinearRegression.RegressionResult

Modifier and Type	Method and Description
static Point2d	**LinearRegression.solve**(LinearRegression.RegressionResult a, LinearRegression.RegressionResult b) Computes the intersection of two RegressionResults

Uses of Class com._604robotics.robot2012.vision.Point3d

Packages that use Point3d

Package	Description
com._604robotics.robot2012.vision	

Uses of Point3d in com._604robotics.robot2012.vision

Methods in com._604robotics.robot2012.vision that return Point3d

Modifier and Type	Method and Description
Point3d	Target.getHoopPosition()
Point3d	Target.getReflectedHoopPosition()
Point3d	Target.getReflectedHoopPosition(double bounceFactor)
Point3d	DistanceCalculations.getRelXYZOfTarget(Quad q) Remember that this requires the camera to be "perfectly" flat, and the targets to be "perfectly" vertical.

Methods in com._604robotics.robot2012.vision with parameters of type Point3d

Modifier and Type	Method and Description
void	Target.setPoint(Point3d point)

Constructors in com._604robotics.robot2012.vision with parameters of type Point3d

Constructor and Description
Target(Point3d point, double angle)

Uses of Class com._604robotics.robot2012.vision.LinearRegression.BackwardsRegressionResult

Packages that use LinearRegression.BackwardsRegressionResult

Package	Description
com._604robotics.robot2012.vision	

Uses of LinearRegression.BackwardsRegressionResult in com._604robotics.robot2012.vision

Methods in com._604robotics.robot2012.vision that return LinearRegression.BackwardsRegressionResult

Modifier and Type	Method and Description
`static LinearRegression.BackwardsRegressionResult`	**LinearRegression.**`getBackwardsRegression(double[] y, double[] x)` This returns a regression result that, instead of having y as a function of x has x as a function of y.

Uses of Class com._604robotics.robot2012.vision.Point2d

Packages that use Point2d

Package	Description
com._604robotics.robot2012.vision	

Uses of Point2d in com._604robotics.robot2012.vision

Methods in com._604robotics.robot2012.vision that return Point2d

Modifier and Type	Method and Description
static Point2d	**LinearRegression.**solve(LinearRegression.RegressionResult a, LinearRegression.RegressionResult b) Computes the intersection of two RegressionResults

Constructors in com._604robotics.robot2012.vision with parameters of type Point2d

Constructor and Description
Quad(Point2d topLeft, Point2d topRight, Point2d bottomLeft, Point2d bottomRight)

Uses of Class com._604robotics.robot2012.vision.Target

Packages that use Target

Package	Description
com._604robotics.robot2012.vision	
com._604robotics.tcpcommunicator	

Uses of Target in com._604robotics.robot2012.vision

Methods in com._604robotics.robot2012.vision that return Target

Modifier and Type	Method and Description
Target	**DistanceCalculations.**getApproximationOfTarget(Quad quad) A method that tries to find the most likely location for the vision target to lie in 3D space

Methods in com._604robotics.robot2012.vision with parameters of type Target

Modifier and Type	Method and Description
int	**Target.**compareTo(Target that)

Uses of Target in com._604robotics.tcpcommunicator

Methods in com._604robotics.tcpcommunicator with parameters of type Target

Modifier and Type	Method and Description
void	**TcpCommunicator.**writePoints(Target[] points) | ritesHte specified points to the stream2

Uses of Class com._604robotics.robot2012.vision.VisionProcessing

Packages that use VisionProcessing

Package	Description
com._604robotics.robot2012.vision	

Uses of VisionProcessing in com._604robotics.robot2012.vision

Fields in com._604robotics.robot2012.vision declared as VisionProcessing

Modifier and Type	Field and Description
static VisionProcessing	**VisionProcessing.defaultProcessing** The default VisionProcessing to use| Ttis should be where the root of all of the vision processing is done

Uses of Class com._604robotics.robot2012.vision.Result.PlusResult

No usage of com._604robotics.robot2012.vision.) esult.Plus) esult

Uses of Class com._604robotics.robot2012.vision.ResultImage

Packages that use ResultImage

Package	Description
com._604robotics.robot2012.vision	

Uses of ResultImage in com._604robotics.robot2012.vision

Methods in com._604robotics.robot2012.vision with parameters of type ResultImage

Modifier and Type	Method and Description
LinearRegression.RegressionResult	VisionProcessing.getRegressionForSide(ResultImage ri, int side, AABB guess) Get a line that best fits the sides of a given target

Uses of Class com._604robotics.robot2012.vision.Result

Packages that use Result

Package	Description
com._604robotics.robot2012.vision	

Uses of Result in com._604robotics.robot2012.vision

Subclasses of Result in com._604robotics.robot2012.vision

Modifier and Type	Class and Description
static class	Result.AntiResult A result indicating that it is unlikely that the target lies in the indicated tile
static class	Result.PlusResult A result indicating that it is likely that the target lies in the indicated tile

Fields in com._604robotics.robot2012.vision declared as Result

Modifier and Type	Field and Description
Result[]	ResultImage.results

Uses of Class com._604robotics.robot2012.vision.Result.AntiResult

No usage of com._604robotics.robot2012.vision.) esult.Anti) esult

Uses of Class com._604robotics.robot2012.vision.LinearRegression

No usage of com._604robotics.robot2012.vision.) inearb egression

Uses of Class com._604robotics.robot2012.vision.Img

Packages that Use Img

Package	Description
com._604robotics.robot2012.vision	

Uses of Img in com._604robotics.robot2012.vision

Methods in com._604robotics.robot2012.vision with parameters of type Img

Modifier and Type	Method and Description
void	HSVImage.computeResults(Img img) This method goes through an Img and finds which pixels appear to match the color of the vision target.
static void	VisionProcessing.recursiveTraceBlobs(Img results, int i, int j, int color)

Uses of Class com._604robotics.robot2012.vision.Quad

Packages that use Quad

Package	Description
com._604robotics.robot2012.vision	

Uses of Quad in com._604robotics.robot2012.vision

Methods in com._604robotics.robot2012.vision with parameters of type Quad

Modifier and Type	Method and Description
double	**DistanceCalculations.**`getAngleOfTarget(Quad q, double z)` This function gets the direction the target is facing, relative to the camera|
`Target`	**DistanceCalculations.**`getApproximationOfTarget(Quad quad)` A method that tries to find the most likel2 location for the vision target to lie in * D space
`Point3d`	**DistanceCalculations.**`getRelXYZOfTarget(Quad q)` h ememu er that this reR uires the camera to u e 0cpe2rfe fl,and the targets to u e 0 perfectl2 0 ver| tical

Uses of Class com._604robotics.robot2012.vision.DistanceCalculations

No usage of com._604robotics.robot2012.vision.DistanceCalculations

Uses of Class com._604robotics.robot2012.vision.VisionDisp

Packages that use VisionDisp

Package	Description
com._604robotics.robot2012.vision	

Uses of VisionDisp in com._604robotics.robot2012.vision

Fields in com._604robotics.robot2012.vision declared as VisionDisp

Modifier and Type	Field and Description
VisionDisp	**VisionProcessing.display** The display for showing the image as well as some debug data.

Uses of Class com._604robotics.robot2012.vision.AABB

Packages that use AABB

Package	Description
com._604robotics.robot2012.vision	

Uses of AABB in com._604robotics.robot2012.vision

Methods in com._604robotics.robot2012.vision with parameters of type AABB

Modifier and Type	Method and Description
LinearRegression.RegressionResult	VisionProcessing.getRegressionOnTarget(ResultZ xgoal, int side, AABB guess) Get a line that best fits the sides of a given target

com._604robotics.robot2012.vision

Class LinearRegression.BackwardsRegressionResult

java.lang.Object
  com._604robotics.robot2012.vision.LinearRegression.RegressionResult
    com._604robotics.robot2012.vision.LinearRegression.BackwardsRegressionResult

Enclosing class:

LinearRegression

```
public static class LinearRegression.BackwardsRegressionResult
extends LinearRegression.RegressionResult
```

A regression result that, instead of having a function of x as an function of y.

See Also:

LinearRegression(double[], double[])

Constructor Summary

Constructors

Constructor and Description
LinearRegression.BackwardsRegressionResult(double slope, double b, double r2)

Method Summary

Methods inherited from class com._604robotics.robot2012.vision.LinearRegression.RegressionResult

toString

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait

Constructor Detail

LinearRegression.BackwardsRegressionResult

```
public LinearRegression.BackwardsRegressionResult(double[] x,
                                                  double[] y,
                                                  RegressionResult regression,
                                                  double slope,
                                                  double b,
                                                  double r2)
```

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Class Point2d

j ava. lang. Ob j ect
com. _ 6 0 4 rob otics. rob ot2 0 1 2 . vision. Point2 d

```
public class Point2d
extends java.lang.Object
```

Th is represents a Point in 2 d space

Field Summary

Fields

Modifier and Type	Field and Description
double	**x** Th e R value
double	**y** The Y vale

Constructor Summary

Constructors

Constructor and Description
Point2d(dub le x, d ble y)

Method Summary

Methods

Modifier and Type	Method and Description
d ble	**gety**( )
d ble	**getY**( )
v id	**Hety**(dub le x) Sets th e X value of th is Point
v id	**HetY**(dub le y) Sets th e Y value of th is Point
j ava. lang. Str ing	**toStping**( )

Methods inherited from class java.lang.Object

clone, equals, f inalize, getClass, hashCode, notif y ,notifyAll, wait, wait, wait

Field Detail

x

```
public double x
```

Th e X value

y

```
public double y
```

The Y vale

Constructor Detail

Point2d

```
public Point2d(double x,
       double y)
```

Parameters:

`x` the R value

`y` the Y value

Method Detail

getX

```
public double getX()
```

Returns:

the X value

getY

```
public double getY()
```

Returns:

the Y value

setX

```
public void setX(double x)
```

Sets the X value of this Point

Parameters:

`x` the X value

setY

```
public void setY(double y)
```

Sets the Y value of this Point

Parameters:

`y` the Y value

toString

```
public java.lang.String toString()
```

Overrides:

`toString` in class `java.lang.Object`

com. _ 6 0 4 rob otics. rob ot2 0 1 2 . vision

Class Target

j ava. lang. Ob j ect
com. _ 6 0 4 rob otics. rob ot2 0 1 2 . vision. Target

All Implemented Interfaces:

j ava. lang. Comparab leTarget,

```
public class Target
extends java.lang.Object
implements java.lang.Comparable<Target>
```

Th is class represents a ph ysical vision Target wi th or main attributes (xy- X - angle(. As well- th ere are es timated unc ertainties attach ed to all of th ese numb ers.

To get th e position of th e h oop, use th e DistanceCalculations class.

Field Summary

Fields

Modifier and Type	Field and Description
double	**angle** Th is is th e angle of th e target, relative to the cam era.
double	**angleUncertainty** Th is is th e uncertainty of th e angle of th e target.
static double	**RelH o o p Y** Th e distance f rom th e center of th e target to (the vertical) val ue of th e h oop.
static double	**RelH o o p Z** Th e distance f rom th e center of th e target to (the dep th) val ue of th e h oop.
double	**x** x, y- and X represent th e 3 - d position of th e vi sion target. x is positive wh en th e target appears to b e ri ght of th e center of th e camera.
double	**xUncertainty** Th ese are th e uncertainties of th e x-, y- and X positions of th e target.
double	**y** x- y- and X represent th e 3 - d position of th e vi sion target. y is positive wh en th e target appears to b e ri ght of th e center of th e camera.
double	**yUncertainty** Th ese are th e uncertainties of th e x-, y- and X positions of th e target.
double	**z** x- y- and X represent th e 3 - d position of th e vi sion target. z is positive wh en th e target appears to b e ri ght of th e center of th e camera.
double	**zUncertainty** Th ese are th e uncertainties of th e x-, y- and X positions of th e target.

Constructor Summary

Constructors

Constructor and Description
Target() A b lank constructor to easily make a Target
Target(double x, double y, double z, double angle)
Target(double x, double y, double z, double xUncertainty, double yUncertainty, double zUncertainty, double angle, double angleUncertainty)
Target(Point3 d point, double angle)

Method Summary

Methods

Modifier and Type	Method and Description
int	compareTo(Target that)
double	getAngle()
double	getAngleUncertainty()
Point3d	getHoopPosition()
Point3d	getReflectedHoopPosition()
Point3d	getReflectedHoopPosition(double bounceFactor)
double	getX()
double	getXUncertainty()
double	getY()
double	getYUncertainty()
double	getZ()
double	getZUncertainty()
void	setAngle(double angle)
void	setAngleUncertainty(double angleUncertainty)
void	setPoint(Point3d point)
void	setX(double x)
void	setXUncertainty(double xUncertainty)
void	setY(double y)
void	setYUncertainty(double yUncertainty)
void	setZ(double z)
void	setZUncertainty(double zUncertainty)
java.lang.String	toString()

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait

Field Detail

RelHoopY

```
public static final double RelHoopY
```

The distance from the center of the target to the (vertical) value of the hoop.

See Also:

Constant Field Values

RelHoopZ

```
public static final double RelHoopZ
```

The distance from the center of the target to the Z (depth) value hoop.

See Also:

Constant Field Values

angle

```
public double angle
```

This is the angle of the target, relative to the camera.

(angle)
. . . . . (Target)
. . . . . /
. . . . . /
. . . . . /
. . . . / - ┤ - f Camera(
. . . /
. . /
. /
/
this value is expressed in radians.

angleUncertainty

```
public double angleUncertainty
```

Th is is th uncertainty of th e angle of th e target. Th is is interpreted as a plus or minus to th e angle. Again, th is is expressed in radians

x

```
public double x
```

x, y- and X represent th e 3 - d position of th e vision target. x will be positive when th e target appears to be to the right of th e center of th e camera. y will be positive wh en th e target appears to b e ab ove of th e center of the camera. X will always b e negative. As the absolute value of z increases, so does th e distance f rom th e camera to the target. To determine th e approximate accuracy of th ese values, ch eck [y-x, X] _uncertainty. Th e units of th ese measures are in inch es.

y

```
public double y
```

x, y- and X represent th e 3 - d position of th e vision target. x will be positive when th e target appears to be to the right of th e center of th e camera. y will be positive wh en th e target appears to b e ab ove of th e center of the camera. X will always b e negative. As the absolute value of z increases, so does th e distance f rom th e camera to the target. To determine th e approximate accuracy of th ese values, ch eck [y-x, X] _uncertainty. Th e units of th ese measures are in inch es.

z

```
public double z
```

x, y- and X represent th e 3 - d position of th e vision target. x will be positive when th e target appears to be to the right of th e center of th e camera. y will be positive wh en th e target appears to b e ab ove of th e center of the camera. X will always b e negative. As the absolute value of z increases, so does th e distance f rom th e camera to the target. To determine th e approximate accuracy of th ese values, ch eck [y-x, X] _uncertainty. Th e units of th ese measures are in inch es.

xUncertainty

```
public double xUncertainty
```

Th ese are th uncertainties of th e x-, y-, and X positions of th e target. Th ese are interpreted as pluses and minuses to th e xy- and X values. Again, th ese are in inch es.

yUncertainty

```
public double yUncertainty
```

Th ese are th uncertainties of th e x-, y-, and X positions of th e target. Th ese are interpreted as pluses and minuses to th e xy- and X values. Again, th ese are in inch es.

zUncertainty

```
public double zUncertainty
```

Th ese are th uncertainties of th e x-, y-, and X positions of th e target. Th ese are interpreted as pluses and minuses to th e xy- and X values. Again, th ese are in inch es.

Constructor Detail

Target

```
public Target()
```

A b lank constructor to easily make a Target

Target

```
public Target(double x,
              double y,
              double z,
              double angle)
```

Parameters:

x - th e X coordinate of th e center of th e vision tar

y - th e) coordinate of th e center of th e vision tar

z - th e Y coordinate of th e center of th e vision tar

angle -

Target

```
public Target(double x,
      double y,
      double z,
      double xUncertainty,
      double yUncertainty,
      double zUncertainty,
      double angle,
      double angleUncertainty)
```

Parameters:

`x` - the X coordinate of the center of the vision target

`y` - the Y coordinate of the center of the vision tar

`z` - the Z coordinate of the center of the vision tar

`xUncertainty` - the X Uncertainty

`yUncertainty` - the) Uncertainty

`zUncertainty` - the Y Uncertainty

`angle` - the Angle

`angleUncertainty` - the Angle Uncertainty

Target

```
public Target(Point3d point,
      double angle)
```

Parameters:

`point` - the Point

`angle` - the Angle

Method Detail

compareTo

```
public int compareTo(Target that)
```

Specified by:

`compareTo` in interface `java.lang.Comparable<Target>`

getAngle

```
public double getAngle()
```

Returns:

the angle that the vision target faces

getAngleUncertainty

```
public double getAngleUncertainty()
```

Returns:

the uncertainty of the Angle

getHoopPosition

```
public Point3d getHoopPosition()
```

Returns:

the position of the hoop relative to the fact that the center of the hoop is not the center of the target

getReflectedHoopPosition

```
public Point3 dgetReflectedHoopPosition()
```

Returns:

the reflected position of the hoop using for the fact that the center of the hoop is not at the center of the target. This is useful because

getReflectedHoopPosition

```
public Point3d getReflectedHoopPosition(double bounceFactor)
```

Parameters:

`bounceFactor` - a number that scales the changes in the x and z distance to correction for hoop position. In a idealized collision, this is equal to the inverse of its coefficient of restitution. However, with spin, this number should be less.

Returns:

the reflected position of the hoop using for the fact that the center of the hoop is not at the center of the target. This is useful because

getX

```
public double getX()
```

Returns:

the X coordinate of the center of the vision target

getXUncertainty

```
public double getXUncertainty()
```

Returns:

the Uncertainty of the X coordinate

getY

```
public double getY()
```

Returns:

the) coordinate of the center of the vision target

getYUncertainty

```
public double getYUncertainty()
```

Returns:

the Uncertainty of the) coordinate

getZ

```
public double getZ()
```

Returns:

the Y coordinate of the center of the vision target

getZUncertainty

```
public double getZUncertainty()
```

Returns:

the Uncertainty of the Y coordinate of the vision target

setAngle

```
public void setAngle(double angle)
```

Parameters:

`angle` - the Angle to set

setAngleUncertainty

`public void setAngleUncertainty(double angleUncertainty)`

Parameters:

`angleUncertainty` - the angleUncertainty to set

setPoint

`public void setPoint(Point3d point)`

Parameters:

`point` - the point to set the center of this target

setX

`public void setX(double x)`

Parameters:

`x` - the X to set

setXUncertainty

`public void setXUncertainty(double xUncertainty)`

Parameters:

`xUncertainty` - the xUncertainty to set

setY

`public void setY(double y)`

Parameters:

`y` - the Y to set

setYUncertainty

`public void setYUncertainty(double yUncertainty)`

Parameters:

`yUncertainty` - the yUncertainty to set

setZ

`public void setZ(double z)`

Parameters:

`z` - the Z to set

setZUncertainty

`public void setZUncertainty(double zUncertainty)`

Parameters:

`zUncertainty` - the Z Uncertainty to set

toString

`public java.lang.String toString()`

public java.lang.String toString()

p **verrides:**

`toString` in class `java.lang.Object`

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Class VisionProcessing

j ava. langb Oject
com.u R 0ok4otics.robot2) 1vis2ion.B isionProcessing

public class **VisionProcessing**
extends java.lang.Object

T* emain class -or processing camera vision on our 2) 1ro2bot. T* isso- twaretakes in camera images - orm t* erobotf scamerazparses t* enzsearc* esor pixels t* atook like s* iny b ue vision targetszb db st* ose pixels toget* erf -it* ye are connectedYzand t* entreats it as a - uadrilateral and - indst* ecorners.

Field Summary

Fields

Modifier and Type	Field and Description
`Config`	**conf** T* eCon- igration - ileor t* isB isionProcessing
`static VisionProcessing`	**defaultProcessing** T* ede- ault B isionProcessing to use" *t is* ould b ev* ere* eroot o- all o- t* evision processing is done
`VisionDisp`	**display** T* edisplay -or s* owing t* eimage as well as some debug data.
`static int`	**Side_Bottom** Constants indicating t* eL e tZopz(ig tand B ottom sides ea target or bounding box.
`static int`	**Side_Left** Constants indicating t* eL e tZopz(ig tand B ottom sides ea target or bounding box.
`static int`	**Side_Right** Constants indicating t* eL e tZopz(ig tand B ottom sides ea target or bounding box.
`static int`	**Side_Top** Constants indicating t* eL e tZopz(ig tand B ottom sides ea target or bounding box.

Constructor Summary

Constructors

Constructor and Description
VisionProcessing() A constructor to create a new B isionProcessing

Method Summary

Methods

Modifier and Type	Method and Description
`LinearRegression.RegressionResult`	**getRegressionForSide**(`ResultImage ri, int side, AABB guess`) G et a line*t ab est its* esides o- a given target
`void`	**loopAndProcessPics**() T* isunction waits -or images - orm t* eimage streamzprocesses t* enzand t* ensends results to t* e robot.
`void`	**loopAndProcessPreSavedPics**() T* isunction is just a simple debug -unction -or testing wit* pre/ saved images
`static void`	**main**(`java.lang.String[] args`) Just a simple mainf Yunction -or running and testing t* etarget tracking
`void`	**processImage**(`java.awt.image.BufferedImage img`) T* isprocesses t* ecamera image and can send it to t* erobot f -ienab ledn t* econ- ig ile)
`static void`	**recursiveTraceBlobs**(`Img results, int i, int j, int color`)

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Field Detail

defaultProcessing

```
public static final VisionProcessing defaultProcessing
```

The default VisionProcessing to use. It should be overridden at the root of all vision processing is done

Side_Left

```
public static final int Side_Left
```

Constants indicating the Left, Top, Right and Bottom sides of a target or bounding box.

See Also:

Constant Field Values

Side_Top

```
public static final int Side_Top
```

Constants indicating the Left, Top, Right and Bottom sides of a target or bounding box.

See Also:

Constant Field Values

Side_Right

```
public static final int Side_Right
```

Constants indicating the Left, Top, Right and Bottom sides of a target or bounding box.

See Also:

Constant Field Values

Side_Bottom

```
public static final int Side_Bottom
```

Constants indicating the Left, Top, Right and Bottom sides of a target or bounding box.

See Also:

Constant Field Values

conf

```
public Config conf
```

The Configuration file for the VisionProcessing

display

```
public final VisionDisp display
```

The display for showing the image as well as some debug data. It shows targets in green and sides and corners in blue.

Constructor Detail

VisionProcessing

```
public VisionProcessing()
```

A constructor to create a new VisionProcessing

Method Detail

getRegressionForSide

```
public L inearRegression.RegressionResult getRegressionForSide(ResultImage ri,
                                                               int side,
                                                               AABB guess)
```

' eta line t* ab est its* esides o- a given target

Parameters:

`ri` / *t e(esultImage t* atndicates w* ic*pixels are contained in t* etarget

`side` / an integer indicating w ic*o- t* esides to pick

`guess` / abounding box t* atsurrounds all o- t* epixels to c* eck

Returns:

t* eline o- b est it or t* egiven side o- t* etarget lying in t* eAAB B

main

```
public static void main(java.lang.String[] args)
                 throws java.lang.InterruptedException,
                        java.io.IOException
```

Just a simple mainf Yunction -or running and testing t* etarget tracking

Throws:

`java.lang.InterruptedException`

`java.io.IOException`

recursiveTraceBlobs

```
public static void recursiveTraceBlobs(Img results,
                       int i,
                       int j,
                       int color)
```

Parameters:

`results` / *t eimg to store returned data in

`i` / *t eX coordinate

`j` / *t eY coordinate

`color` / *t edb db fcsolor

loopAndProcessPics

```
public void loopAndProcessPics()
                        throws java.net.MalformedURLException
```

T* isunction waits -or images - om t* eimage streamzprocesses t* enzand t* ensends results to t* erobot.

Throws:

`java.net.MalformedURLException`

loopAndProcessPreSavedPics

```
public void loopAndProcessPreSavedPics()
                                 throws java.io.IOException
```

T* isunction is just a simple debug -unction -or testing wit* pre/ saved imagesCurrently, it just reads over a loop o- 5) pictures saved as target/ [umb er].peg

Throws:

`java.io.IOException`

processImage

```
public void processImage(java.awt.image.BufferedImage img)
```

T* isprocesses t* ecamera image and can send it to t* erobot f -ienab ledn t* econ- ig ile)

Parameters:

`img` / an image as received- orm t* ecamera

Hierarchy For Package com._604robotics.robot2012.vision

Package Hierarchies:
All Packages

Class Hierarchy

- java.lang.Object
  - com._604robotics.roboth 2 uvision.p p B B
  - java.awt.Component R implements java.awt.image.ImageObserver) java.awt.b enb Containerj java.io.2 eriali1bbej
    - java.awt.Container
      - javax.swing.B Component R implements java.io.2 eriali1bbej
        - javax.swing.B PaneR implements javax.accessibility.Accessiblej
          - com._604robotics.roboth 2 uvision.VisionDisp
  - com._604robotics.roboth 2 uvision.**DistanceCalculations**
  - com._604robotics.roboth 2 uvision.**Ang**
  - com._604robotics.roboth 2 uvision.**LinearR gression**
  - com._604robotics.roboth 2 uvision.**LinearR gression.R gressionR sult**
    - com._604robotics.roboth 2 uvision.**LinearR gression.B ackwardsR gressionR sult**
  - com._604robotics.roboth 2 uvision.**Point2**d
  - com._604robotics.roboth 2 uvision.**Point**3 d
  - com._604robotics.roboth 2 uvision.Q **ua**d
  - com._604robotics.roboth 2 uvision.R **sult**
    - com._604robotics.roboth 2 uvision.R **sult.p ntiR sult**
    - com._604robotics.roboth 2 uvision.R **sult.PlusR sult**
  - com._604robotics.roboth 2 uvision.R **sultA mage**
  - com._604robotics.roboth 2 uvision.**Target** R implements java.lang.Comparablef Tz j
  - com._604robotics.roboth 2 uvision.**VisionProcessing**

Package com._604robotics.robot2012.vision

Class Summary

Class	Description
AABB	An Axis-Aligned Bounding Box.
DistanceCalculations	T| isscode does t| e2 Dto-* Dcalculations
Img	A simple class hor accessing 2 odata in a 1d array) wit| bounds c| ecking
LinearRegression	Accepts a sebuence ohpairs ohreal numb ersand computes t| eb esth i2 leastsbuares1line y j ax B b t| orug| t| eset ohpoints.
LinearRegression.BackwardsRegressionResult	A regression result t| at0nstead oh| avingy as a h unoton ohx	asx as a h unoton ohy.
LinearRegression.RegressionResult	A regression result t| atindicates t| eline t| ab estmatc| esa given set ohdata.
Point2d	T| isrepresents a Point in 2 ospace
Point3d	T| isrepresents a point in * ospace
Quad	A class representing a - uadrilateral) wit| hour corner points.
Result	T| isclass stores one tile ohf isn targetf data.
Result.AntiResult	A result indicating t| att is unlikely t| at| etarget lies in t| eindicated tile
Result.PlusResult	A result indicating t| att is likely t| at| etarget lies in t| eindicated tile
ResultImage	A result image t| at olds an image oh| ow well pixels matc| t| eexpected color oht| evision target.
Target	T| isclass represents a p| 6 sicalsion Target wit| hour main attributes 2 xy) z)angle1.
VisionDisp	T| isclass is used to display a camera image and some debug inhormation along wit| it.
VisionProcessing	T| emain class hor processing camera vision on our 2 f uro2ot.

com._604robotics.robot2012.vision

Class Result.PlusResult

java.lang.Object
  com._604robotics.robot2012.vision.Result
    com._604robotics.robot2012.vision.Result.PlusResult

Enclosing class:

Result

```
public static class Result.PlusResult
extends Result
```

A result indicating that it is likely that the target lies in the indicated tile

Nested Class Summary

Nested classes/interfaces inherited from class com._604robotics.robot2012.vision.Result

Result.AntiResult, Result.PlusResult

Constructor Summary

Constructors

Constructor and Description
Result.PlusResult(int tileSize, byte[] dat) A simple constructor to make a PlusResult.

Method Summary

Methods

Modifier and Type	Method and Description
boolean	**hasPlus**()
boolean	**plusAt**(int x, int y)

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

Result.PlusResult

```
public Result.PlusResult(int tileSize,
                         byte[] dat)
```

A simple constructor to make a PlusResult.

Parameters:

tileSize - the size of the tile

dat - the array of bytes indicating how well the pixel matches the target.

Method Detail

hasPlus

```
public boolean hasPlus()
```

Overrides:

`hasPlus` in class `Result`

Returns:

whether there are any pixels matching the color of target or not

plusAt

```
public boolean plusAt(int x,
                      int y)
```

Overrides:

`plusAt` in class `Result`

Parameters:

`x` - the coordinate X within the tile (not the) e image

`y` - the Y coordinate within the tile (not the) e image

Returns:

whether or not the pixel at the given location matches the Target color

com. _ 6 0 4 rob otics. rob ot2 0 1 2 . vision

Class ResultImage

j ava. lang. Ob j ect
com. _ 6 0 4 rob otics. rob ot2 0 1 2.ImageVision. R es

```
public class ResultImage
extends java.lang.Object
```

A result image t* at * olds an image o0 * ow well pixels matc* t*e desk color o0 t* e vision targeth It is treated e likgiant Q oolean arry externallyf bt internally it is split up into small tiles.

See Also:

Result

Field Summary

Fields

Modifier and Type	Field and Description
Result[]	results

Constructor Summary

Constructors

Constructor and Description
ResultImage(int imW, int imH) A constructor to create a new B esltImage.

Method Summary

Methods

Modifier and Type	Method and Description
void	computeResults(Img img) T* is met* od goes t*ugh an Img and - inds w ic* pixels appear to matc* t* e color o0 t* e targeth
boolean	isTarget(int x, int y)

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Field Detail

results

```
public Result[] results
```

Constructor Detail

ResultImage

```
public ResultImage(int imW,
           int imH)
```

A constructor to create a new B esltImage. To actually initializ e* e retrned B esltImagef use ResultImage

A constructor to create a new BinaryImage. To actually initialize the returned BinaryImage use ResultImage

Parameters:

`imW` f t* e widt* o0 t* e image

`imH` f t* e * eig* t o0 t* e image

Method Detail

computeResults

```
public void computeResults(Img img)
```

T* is met* od goes t*ugh an `Img` and - inds w ic* pixels appear to matc* t* e color o0 t* e target with

Parameters:

`img` f t* e image to process and 0 ind matc* ing Target ed pixels

isTarget

```
public boolean isTarget(int x,
                        int y)
```

Parameters:

`x` f T* e 8 coordinate, in pixels

`y` f T* e q coordinate, in pixels

Returns:

com._6048robotics.robot2012.vision

Class Result

java.lang.Object
  com._6048robotics.robot2012.vision.Results

Direct Known Subclasses:

Results.AntiResult, Results.PlusResult

```
public abstract class Result
extends java.lang.Object
```

This class stores one tile of the image data. If there are no matches, or the target is a Results.AntiResult is used. If there are matching pixels a Result.PlusResult is used.

Nested Class Summary

Nested Classes

Modifier and Type	Class and Description
static class	**Result.AntiResult** A result indicating that it is unlikely that the target lies in the indicated tile
static class	**Result.PlusResult** A result indicating that it is likely that the target lies in the indicated tile

Constructor Summary

Constructors

Constructor and Description
Result()

Method Summary

Methods

Modifier and Type	Method and Description
boolean	**hasPlus**()
boolean	**plusAt**(int x, int y)

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

Result

```
public Result()
```

Method Detail

hasPlus

```
public boolean hasPlus()
```

Returns:

whether there are any pixels matching the color of target or not

plusAt

```
public boolean plusAt(int x,
                      int y)
```

Parameters:

`x` - the X coordinate (within the tile, not the image)

`y` - the Y coordinate (within the tile, not the image)

Returns:

whether or not the pixel at the given location matches the Target color

com.u R 0 4 roQ oticsh roQ ot2 0 1 2 h vision

Class Result.AntiResult

z avah langh OQ z ect

com.u R 0 4 roQ oticsh roQ ot2 0 1 2 h vision.Result

com.u R 0 4 roQ oticsh roQ ot2 0 1 2 h vision.Result.AntiResult

Enclosing class:

Result

```
public static class Result.AntiResult
extends Result
```

A result indicating that it is unlikely that the target lies in the indicated tile

Nested Class Summary

Nested classes/interfaces inherited from class com._604robotics.robot2012.vision.Result

Result.AntiResult, Result.PlusResult

Constructor Summary

Constructors

Constructor and Description
Result.AntiResult()

Method Summary

Methods inherited from class com._604robotics.robot2012.vision.Result

hasPlus, plusAt

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

Result.AntiResult

```
public Result.AntiResult()
```

com._604robotics.robot2012.vision

Classes

AABB
DistanceCalculations
Img
LinearRegression
LinearRegression.BackwardsRegressionResult
LinearRegression.RegressionResult
Point2d
Point3d
Quad
Result
Result.AntiResult
Result.PlusResult
ResultImage
Target
VisionDisp
VisionProcessing

comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h vision

Class LinearRegression

z avah langh OQ z ect
comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h visionh) inear0 egression

---

```
public class LinearRegression
extends java.lang.Object
```

Accepts a se, uence of pairs of real numb ers and comptes t* e Q est f it f leastsaresYline y - ax " b *t rough t* e set of pointsh Also comtes t* e correlation coef f icient and t* e standard error of t* e regressiof f icientsh

Nested Class Summary

Nested Classes

Modifier and Type	Class and Description
static class	**LinearRegression.BackwardsRegressionResult** A regression result t* atV instead of * ayiag a function of x * as x as afnction of y.
static class	**LinearRegression.RegressionResult** A regression result t* at indicates t* e line t* at Q est matc* es a given set of datah

Constructor Summary

Constructors

Constructor and Description
LinearRegression()

Method Summary

Methods

Modifier and Type	Method and Description
static **LinearRegression.BackwardsRegressionResult**	**getBackwardsRegression**(double[] y, double[] x) T* is retrns a regression result t* atV instead of * ayiag a function of x * as x as a function of y.
static **LinearRegression.RegressionResult**	**getRegression**(double[] x, double[] y) T* isfnction computes t* e linear regression of a set of x and values.
static **Point2d**	**solve**(**LinearRegression.RegressionResult** a, **LinearRegression.RegressionResult** b) Computes t* e intersection of two 0 egressionOltes

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

LinearRegression

```
public LinearRegression()
```

Method Detail

getBackwardsRegression

```
public static LinearRegression.BackwardsRegressionResult getBackwardsRegression(double[] y,
                                                                                 double[] x)
```

T* is returns a regression result t* atV instead of * ayinas a function of x * as x as a function of y.

Parameters:

`y` (t* e list of) uses

`x` (t* e list of ' uses

Returns:

getRegression

```
public static LinearRegression.RegressionResult getRegression(double[] x,
                                                               double[] y)
```

This function computes t* e linear regression of a set of x and values.

It is largely taken from: * ttp/ introcs.cs.princeton.edu/j ava/ 9 7 data/ B inear- egression.html

Parameters:

`x` (An arra of X values

`y` (An array of) values

Returns:

solve

```
public static Point2d solve(LinearRegression.RegressionResult a,
            LinearRegression.RegressionResult b)
```

Computes t* e intersection of two 0 egression0 lts

Parameters:

`a` (A - egression- ult

`b` (A - egression- ult

Returns:

The intersection

comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h vision

Class Img

z avah langh OQ z ect
comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h visionh Img

```
public class Img
extends java.lang.Object
```

A simple class) or accessing 2 d data in a 1 d arrawit Quods c* eckingh

Constructor Summary

Constructors

Constructor and u esrn n tn on
Img(int[] dat, int w, int h) A constructor to make an Img
Img(int w, int h) A constructor to make an Img
Img(java.awt.image.Raster raster) A constructor to make an Img
Img(java.awt.image.Raster raster, int[] buff) A constructor to make an Img

T etS c Summary

Methods

Modn u n er anype	Method and u esrn n tn on
int	**get**(int x, int y)
boolean	**set**(int x, int y, int k)

T etS op s n nS ern te lassrjava.lang.g Oct e

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor u etan l

Img

```
public Img(int[] dat,
   int w,
   int h)
```

A constructor to make an Img

Parametersb

dat f data arra

w f widt

h, * eig* t

Img

```
public Img(java.awt.image.Raster raster,
   int[] buff)
```

A constructor to make an Img

Parametersb

raster f a raster storing original image data

buff, an array to store the image data into

Img

```
public Img(java.awt.image.Raster raster)
```

A constructor to make an Img

Parameters:

raster a raster storing original image data

Img

```
public Img(int w,
           int h)
```

A constructor to make an Img

Parameters:

w

h

Method Summary

get

```
public int get(int x,
               int y)
```

Parameters:

x the x coordinate

y, the y coordinate

Returns:

an integer holding an 8 bit value

set

```
public boolean set(int x,
                   int y,
                   int k)
```

Parameters:

x the x coordinate

y, the y coordinate

k, an integer holding an 8 bit value

Returns:

a boolean indicating whether the value was set or not

comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h vision

Class Quad

z avah langh OQ z ect
comh u R 0 4 roQ oticsh roQ ot2 0ua2d2 h visionh)

```
public class Quad
extends java.lang.Object
```

A class representing a Buadrilateral- wit ,uocorner points.

Constructor Summary

Constructors

Constructor and Description
Quad(**Point2d** topLeft, **Point2d** topRight, **Point2d** bottomLeft, **Point2d** bottomRight)

Method Summary

Methods

Modifier and Type	Method and Description
double	**getAvgHeight**()
double	**getAvgWidth**()
double	**getAvgX**()
double	**getAvgY**()
double	**getMaxX**()
double	**getMaxY**()
double	**getMinX**()
double	**getMinY**()
java.lang.String	**toString**()

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait

Constructor Detail

Quad

```
public Quad(Point2d topLeft,
    Point2d topRight,
    Point2d bottomLeft,
    Point2d bottomRight)
```

Parameters:

topLeft z

topRight z

bottomLeft z

bottomRight z

Method Detail

toString

```
public java.lang.String toString()
```

Overrides:

`toString` in class `java.lang.Object`

getAvgWidth

```
public double getAvgWidth()
```

Returns:

t* e average widt* o, t* uisd)

getAvgHeight

```
public double getAvgHeight()
```

Returns:

the average * eig* t o, t* uisd)

getAvgX

```
public double getAvgX()
```

Returns:

the average f values of *t is)uad

getAvgY

```
public double getAvgY()
```

Returns:

the average Y values of *t is)uad

getMinX

```
public double getMinX()
```

Returns:

the minimum f value of *t is)uad

getMaxX

```
public double getMaxX()
```

Returns:

the maximum f value of *t is)uad

getMinY

```
public double getMinY()
```

Returns:

the minimum Y value of *t is)uad

getMaxY

```
public double getMaxY()
```

Returns:

the maximum Y value of *t is)uad

comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h vision

Class DistanceCalculations

z avah langh OQ z ect
comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h vision.utilDistanceCalc

---

```
public class DistanceCalculations
extends java.lang.Object
```

T* is code does t* e 2 D) to) 0ulations

Field Summary

Fields

Modifier and Type	Field and Description
static double	**cameraPixelHeight** T* e si, e of t* e Axis cameraf in pixels
static double	**cameraPixelWidth** T* e si, e of t* e Axis cameraf in pixels

Constructor Summary

Constructors

Constructor and Description
DistanceCalculations()

Method Summary

Methods

Modifier and Type	Method and Description
double	**getAngleOfTarget**(**Quad** q, double z) T* isunction gets t* e direction t* e target is f acingf relative to camerah
Target	**getApproximationOfTarget**(**Quad** quad) A met* od t* at tries to f ind t* e mostlikelation for t* e vision target to lie in 0 D space
Point3d	**getRelXYZOfTarget**(**Quad** q) 8 ememQ er t* at t* isuires t* e camera to Q e " perfy'erdf and t* e targets to Q e " perfy'erdrtical.

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Field Detail

cameraPixelHeight

```
public static final double cameraPixelHeight
```

T* e si, e of t* e Axis cameraf in pixels

See Also:

Constant Field V alues

cameraPixelWidth

```
public static final double cameraPixelWidth
```

I* e si, e of t* e Axis camerat in pixels

See Also:

Constant Field V alues

Constructor Detail

DistanceCalculations

```
public D istanceCalculations()
```

Method Detail

getAngleOfTarget

```
public double getAngleOfTarget(Quad q,
                               double z)
```

This function gets t* e direction t* e target is f acingf relative tocamerah It is imperf ectf and * alunnecessa simple ort* ograp* ic proz ection (w* ic* is not quite like real life). If it causes issues (w ic* t* e accuracy of t* isfunction doesn' tneed to b e very * ig*) f we can f ix it laterh

Returns:

t* e resulting angle in radians.

getApproximationOfTarget

```
public Target getApproximationOfTarget(Quad quad)
```

A met* od t* at tries to f ind t* e mostlikelocation for t* e vision target to lie in 0 D space

Parameters:

`quad`) a quadrilateral wit* corners indicating t* e corners of t* e target

Returns:

a Target as an estimation of

getRelXYZOfTarget

```
public Point3d getRelXYZOfTarget(Quad q)
```

8 ememQ er t* at t* is inreq t* e camera to Q e " perfy'sfdlf and t* e targets to Q e " perfy'svertical. A new function will prob aby need to b e created z oruse on t* e roQ oth T* atf or we' ll need tounderstand t* e points Q ased on camera angleh

Returns:

a Point0 d * olding t* e X f Y f and Z of t*lativetargetf ecamerah

comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h vision

Class VisionDisp

z avah langh OQ z ect
z avah awth Component
z avah awth Container
z avaxh swingh) Component
z avaxh swingh) Panel
comh u R 0 4 roQ oticsh roQ ot2 0 1 2 h visionh 0 isionDisp

All Implemented Interfaces:

z avah awth imageh ImageOQ server, z avah uSerializ ab lef j ava.Serializ ab lef j avax.accessib ilityAccessib le

---

```
public class VisionDisp
extends javax.swing.JPanel
```

T* is class is used to display a camera image and some debug information along wit* ith

See Also:

Serializ ed Form

Nested Class Summary

Nested classes/interfaces inherited from class javax.swing.JPanel

javax.swing.JPanel.AccessibleJPanel

Nested classes/interfaces inherited from class javax.swing.JComponent

javax.swing.JComponent.AccessibleJComponent

Nested classes/interfaces inherited from class java.awt.Container

java.awt.Container.AccessibleAWTContainer

Nested classes/interfaces inherited from class java.awt.Component

java.awt.Component.AccessibleAWTComponent, java.awt.Component.BaselineResizeBehavior, java.awt.Component.BltBufferStrategy, java.awt.Component.FlipBufferStrategy

Field Summary

Fields

Modifier and Type	Field and Description
java.awt.image.BufferedImage	**image** T* e Q ackgrou nd imagef as received f rom th e camera

Fields inherited from class javax.swing.JComponent

accessibleContext, listenerList, TOOL_TIP_TEXT_KEY, ui, UNDEFINED_CONDITION, WHEN_ANCESTOR_OF_FOCUSED_COMPONENT, WHEN_FOCUSED, WHEN_IN_FOCUSED_WINDOW

Fields inherited from class java.awt.Component

BOTTOM_ALIGNMENT, CENTER_ALIGNMENT, LEFT_ALIGNMENT, RIGHT_ALIGNMENT, TOP_ALIGNMENT

Fields inherited from interface java.awt.image.ImageObserver

ABORT, ALLBITS, ERROR, FRAMEBITS, HEIGHT, PROPERTIES, SOMEBITS, WIDTH

Constructor Summary

Constructors

Constructor and Description
VisionDisp() A def alt constructor t* at sets t* isp as a R 4 0 x4 8 0 ydispla

Method Summary

Methods

Modifier and Type	Method and Description
void	**paint**(java.awt.Graphics g) Paints t* isVisionDisph

Methods inherited from class javax.swing.JPanel

getAccessibleContext, getUI, getUIClassID, paramString, setUI, updateUI

Methods inherited from class javax.swing.JComponent

addAncestorListener, addNotify, addVetoableChangeListener, computeVisibleRect, contains, createToolTip, disable, enable, firePropertyChange, firePropertyChange, firePropertyChange, fireVetoableChange, getActionForKeyStroke, getActionMap, getAlignmentX, getAlignmentY, getAncestorListeners, getAutoscrolls, getBaseline, getBaselineResizeBehavior, getBorder, getBounds, getClientProperty, getComponentGraphics, getComponentPopupMenu, getConditionForKeyStroke, getDebugGraphicsOptions, getDefaultLocale, getFontMetrics, getGraphics, getHeight, getInheritsPopupMenu, getInputMap, getInputMap, getInputVerifier, getInsets, getInsets, getListeners, getLocation, getMaximumSize, getMinimumSize, getNextFocusableComponent, getPopupLocation, getPreferredSize, getRegisteredKeyStrokes, getRootPane, getSize, getToolTipLocation, getToolTipText, getToolTipText, getTopLevelAncestor, getTransferHandler, getVerifyInputWhenFocusTarget, getVetoableChangeListeners, getVisibleRect, getWidth, getX, getY, grabFocus, isDoubleBuffered, isLightweightComponent, isManagingFocus, isOpaque, isOptimizedDrawingEnabled, isPaintingForPrint, isPaintingOrigin, isPaintingTile, isRequestFocusEnabled, isValidateRoot, paintBorder, paintChildren, paintComponent, paintImmediately, paintImmediately, print, printAll, printBorder, printChildren, printComponent, processComponentKeyEvent, processKeyBinding, processKeyEvent, processMouseEvent, processMouseMotionEvent, putClientProperty, registerKeyboardAction, registerKeyboardAction, removeAncestorListener, removeNotify, removeVetoableChangeListener, repaint, repaint, requestDefaultFocus, requestFocus, requestFocus, requestFocusInWindow, requestFocusInWindow, resetKeyboardActions, reshape, revalidate, scrollRectToVisible, setActionMap, setAlignmentX, setAlignmentY, setAutoscrolls, setBackground, setBorder, setComponentPopupMenu, setDebugGraphicsOptions, setDefaultLocale, setDoubleBuffered, setEnabled, setFocusTraversalKeys, setFont, setForeground, setInheritsPopupMenu, setInputMap, setInputVerifier, setMaximumSize, setMinimumSize, setNextFocusableComponent, setOpaque, setPreferredSize, setRequestFocusEnabled, setToolTipText, setTransferHandler, setUI, setVerifyInputWhenFocusTarget, setVisible, unregisterKeyboardAction, update

Methods inherited from class java.awt.Container

add, add, add, add, add, addContainerListener, addImpl, addPropertyChangeListener, addPropertyChangeListener, applyComponentOrientation, areFocusTraversalKeysSet, countComponents, deliverEvent, doLayout, findComponentAt, findComponentAt, getComponent, getComponentAt, getComponentAt, getComponentCount, getComponents, getComponentZOrder, getContainerListeners, getFocusTraversalKeys, getFocusTraversalPolicy, getLayout, getMousePosition, insets, invalidate, isAncestorOf, isFocusCycleRoot, isFocusCycleRoot, isFocusTraversalPolicyProvider, isFocusTraversalPolicySet, layout, list, list, locate, minimumSize, paintComponents, preferredSize, printComponents, processContainerEvent, processEvent, remove, remove, removeAll, removeContainerListener, setComponentZOrder, setFocusCycleRoot, setFocusTraversalPolicy, setFocusTraversalPolicyProvider, setLayout, transferFocusDownCycle, validate, validateTree

Methods inherited from class java.awt.Component

action, add, addComponentListener, addFocusListener, addHierarchyBoundsListener, addHierarchyListener, addInputMethodListener, addKeyListener, addMouseListener, addMouseMotionListener, addMouseWheelListener, bounds, checkImage, checkImage, coalesceEvents, contains, createImage, createImage, createVolatileImage, createVolatileImage, disableEvents, dispatchEvent, enable, enableEvents, enableInputMethods, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, firePropertyChange, getBackground, getBounds, getColorModel, getComponentListeners, getComponentOrientation, getCursor, getDropTarget, getFocusCycleRootAncestor, getFocusListeners, getFocusTraversalKeysEnabled, getFont, getForeground, getGraphicsConfiguration, getHierarchyBoundsListeners, getHierarchyListeners, getIgnoreRepaint, getInputContext, getInputMethodListeners, getInputMethodRequests, getKeyListeners, getLocale, getLocation, getLocationOnScreen, getMouseListeners, getMouseMotionListeners, getMousePosition, getMouseWheelListeners, getName, getParent, getPeer, getPropertyChangeListeners, getPropertyChangeListeners, getSize, getToolkit, getTreeLock, gotFocus, handleEvent, hasFocus, hide, imageUpdate, inside, isBackgroundSet, isCursorSet, isDisplayable, isEnabled, isFocusable, isFocusOwner, isFocusTraversable, isFontSet, isForegroundSet, isLightweight, isMaximumSizeSet, isMinimumSizeSet, isPreferredSizeSet, isShowing, isValid, isVisible, keyDown, keyUp, list, list, list, location, lostFocus, mouseDown, mouseDrag, mouseEnter, mouseExit, mouseMove, mouseUp, move, nextFocus, paintAll, postEvent, prepareImage, prepareImage, processComponentEvent, processFocusEvent, processHierarchyBoundsEvent, processHierarchyEvent, processInputMethodEvent, processMouseWheelEvent, remove, removeComponentListener, removeFocusListener, removeHierarchyBoundsListener, removeHierarchyListener, removeInputMethodListener, removeKeyListener, removeMouseListener, removeMouseMotionListener, removeMouseWheelListener, removePropertyChangeListener, removePropertyChangeListener, repaint, repaint, repaint, resize, resize, setBounds, setBounds, setComponentOrientation, setCursor, setDropTarget, setFocusable, setFocusTraversalKeysEnabled, setIgnoreRepaint, setLocale, setLocation, setLocation, setName, setSize, setSize, show, show, size, toString, transferFocus, transferFocusBackward, transferFocusUpCycle

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, wait, wait, wait

Field Detail

image

public java.awt.image.BufferedImage image

T* e Q ackgu od imagef as received f rom* te camera

Constructor Detail

VisionDisp

public VisionDisp()

A def alt constructor t* at sets t* isp as a R 4 0 x4 8 0 ydispla

Method Detail

paint

public void paint(java.awt.Graphics g)

Paints t* isVisionDisph

If availaQ le, t* is draws t* e camera imagedtingetiled red- and- gree'nisTargetl'imagef target cornersf and target sides

Overrides:

paint in class javax.swing.JComponent

See Also:

JComponent.paint(java.awt.Graphics)

Uses of Package com._604robotics.robot2012.vision

Packages th tuse com._604robotics.robot2012.vision

Package	Description
com._604robotics.robot2012.vision	
com._604robotics.tcpcommu icator	

Classes in com._604robotics.robot2012.vision use. by com._604robotics.robot2012.vision

Class an.	T seription
g g O O An Axis-Aligned Bounding Box.	
bmg A simple class for accessing 2 d data in a * d arrah u witR 0 ounds cR ecking	
1inear2 egession.O akwar. s2 egession2 su tT A regression result tR atu instead R aving h as function of x R as x as a function of h.	
1inear2 egession.2 egession2 su tT A regression result tR at indicates tR e line tR at 0 est matcR es a given set of data.	
Point2. TR is represents a Point in 2 d space	
Point3 . TR is represents a point in 4 d space	
Q u a. A class representing a Q uadrilateralu with R ur corner points.	
2 su tT TR is class stores one tile f " is in target" data	
2 su tTmage A result image tR at R olds an image f R ow well pixels matcR tR e expected colo tR e vision target	
Target TR is class represents a pR h sical vision Target with R main attri) utes (x, h u z u angle)	
VisionDisp TR is class is used to displah a camera image and some 0 ug information along witR it	
VisionProcessing TR e main class for processing camera vision on our 2 0 * 2 ro0 ot	

Classes in com._604robotics.robot2012.vision use. by com._604robotics.tcpcommu icator

Class an.	T seription
Target TR is class represents a pR h sical vision Target with R main attri) utes (x, h u z u angle)	

com._604robotics.robot2012.vision

Class AABB

java.lang.Object
  com._604robotics.robot2012.vision.AABB

```
public class AABB
extends java.lang.Object
```

An Axis-Aligned Bounding Box. This stores two opposite corner values of a rectangle that aligns perfectly with vertical and horizontal sides.

Field Summary

Fields

Modifier and Type	Field and Description
int	x1
int	x2
int	y1
int	y2

Constructor Summary

Constructors

Constructor and Description
AABB(int x1, int y1, int x2, int y2)

Method Summary

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Field Detail

x1

```
public int x1
```

y1

```
public int y1
```

x2

```
public int x2
```

y2

```
public int y2
```

Constructor Detail

AABB

```
public AABB(int x1,
    int y1,
    int x2,
    int y2)
```

Parameters:

`x1` - - lowest x value on the rectangle

`y1` - - lowest y value on the rectangle

`x2` - - * ig* est value on the rectangle

`y2` - - * ig* est value on the rectangle

Uses of Class com._604robotics.tcpcommunicator.TcpCommunicator

No usage of com._604robotics.tcpcommunicator.TcpCommunicator

Overview Package Class Use Tree Deprecated Index Help

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Hierarchy For Package com._604robotics.tcpcommunicator

Package Hierarchies:
All Packages

Class Hierarchy

- java.lang.Object
  - com._604robotics.tcpcommunicator.TcpCommunicator implements java.lang.Runnable)

Package com._604robotics.tcpcommunicator

Class Summary

Class	Description
TcpCommunicator	Server class for the vision data transfer protocol.

com._604robotics.tcpcommunicator

Classes

TcpCommunicator

Uses of Package com._604robotics.tcpcommu icator

No usage of com.: | M.h rics.tcpcommunicator

com.rapidminer.tools.tcpcommunicator

Class TcpCommunicator

java.lang.Object
  com.rapidminer.tools.tcpcommunicator.TcpCommunicator

All Implemented Interfaces:

java.lang.Runnable

```
public class TcpCommunicator
extends java.lang.Object
implements java.lang.Runnable
```

Server class for the visio natal transfer protocol.

Constructor Summary

Constructors

Constructor and Description
TcpCommunicator() Initializes a new TcpCommunicator.
TcpCommunicator(java.lang.String ip) Initializes a new TcpCommunicator with the specified robot IP address.
TcpCommunicator(java.lang.String ip, int port) Initializes a new TcpCommunicator with the specified robot IP address and port.
TcpCommunicator(java.lang.String ip, int port, boolean debug) Initializes a new TcpCommunicator with the specified robot IP address, port, and debug mode.

Method Summary

Methods

Modifier and Type	Method and Description
void	**down**() Disables the TcpCommunicator.
void	**forceQuit**() Interrupts the TcpCommunicator thread, forcing it to quit.
boolean	**isEnabled**() Checks whether or not the TcpCommunicator has been enabled.
boolean	**isRunning**() Checks whether or not the TcpCommunicator thread is currently running.
static void	**main**(java.lang.String[] args) For testing purposes.
void	**run**() Don't use this to launch the server; use up() instead.
void	**up**() Enables the TcpCommunicator, launching the thread.
void	**writePoints**(**Target**[] points) Writes the specified points to the stream.

Methods inherited from class java.lang.Object

clone, equals, finalize, getClass, hashCode, notify, notifyAll, toString, wait, wait, wait

Constructor Detail

TcpCommunicator

```
public TcpCommunicator()
```

Initializes a new TcpCommunicator. By default, the robot IP address is set to "10.66.171.21", port is set to 31337, and the debug mode is set to TRUE.

TcpCommunicator

```
public TcpCommunicator(java.lang.String ip)
```

Initializes a new TcpCommunicator with the specified robot IP address. By default, the port is set to 33333 and the debug mode is set to TRUE.

Parameters:

`ip` - the IP address of the robot.

TcpCommunicator

```
public TcpCommunicator(java.lang.String ip,
                       int port)
```

Initializes a new TcpCommunicator with the specified robot IP address and port. By default, debugging mode is set to TRUE.

Parameters:

`ip` - the IP address of the robot.

`port` - the port to connect to.

TcpCommunicator

```
public TcpCommunicator(java.lang.String ip,
                       int port,
                       boolean debug)
```

Initializes a new TcpCommunicator with the specified robot IP address, port, and debug mode

Parameters:

`ip` - the IP address of the robot.

`port` - the port to connect to.

`debug` - Print debug info?

Method Detail

isEnabled

```
public boolean isEnabled()
```

Checks whether or not the TcpCommunicator has been enabled.

Returns:

Whether or not the TcpCommunicator has been enabled.

isRunning

```
public boolean isRunning()
```

Checks whether or not the TcpCommunicator thread is currently running.

Returns:

Whether or not the TcpCommunicator thread is currently running.

up

```
public void up()
```

Enables the TcpCommunicator, launching the thread.

down

```
public void down()
```

Disables the TcpCommunicator.

forceQuit

```
public void forceQuit()
```

Interrupts the TcpCommunicator thread, forcing it to quit. Use only in emergencies!

writePoints

```
public void writePoints(Target[] points)
```

Writes the specified points to the stream. If there is no robot currently connected, it fails silently and discards the points into the ether.

Parameters:

`points` - An array of targets to write.

run

```
public void run()
```

Don't use this to launch the server; use start() instead. This implements the run() method of Runnable, allowing this to be run as a thread. For internal use!

Specified by:

`run` in interface `java.lang.Runnable`

main

```
public static void main(java.lang.String[] args)
```

For testing purposes. Running this as an application will connect to 127.0.0.1 and stream arbitrary data for testing purposes.

Parameters:

`args` - Command-line arguments. Not currently used

All Classes

Packages

com._604robotics.robot2012.vision
com._604robotics.robot2012.vision.config
com._604robotics.tcpcommunicator
com.charliemouse.cambozola.shared
com.mobvcasting.mjpegparser

Constant Field Values

Contents

com._604robotics.*

com._604robotics.robot2012.vision.DistanceCalculations

Modifier and Type	Constant Field	Value
public static final double	cameraPixelHeight	480.0
public static final double	cameraPixelWidth	640.0

com._604robotics.robot2012.vision.Target

Modifier and Type	Constant Field	Value
public static final double	RelHoopY	-11.0
public static final double	RelHoopZ	15.0

com._604robotics.robot2012.vision.VisionProcessing

Modifier and Type	Constant Field	Value
public static final int	Side_Bottom	3
public static final int	Side_Left	0
public static final int	Side_Right	2
public static final int	Side_Top	1

com.charliemouse.*

com.charliemouse.cambozola.shared.CamStream

Modifier and Type	Constant Field	Value
public static final int	CONNECT_STYLE_HTTP	2
public static final int	CONNECT_STYLE_SOCKET	1

com.charliemouse.cambozola.shared.StreamSplit

Modifier and Type	Constant Field	Value
public static final java.lang.String	BOUNDARY_MARKER_PREFIX	"--"
public static final java.lang.String	BOUNDARY_MARKER_TERM	"--"