AsTeRICS

Quick-Start Guide

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Document Information

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AsTeRICS – Assistive Technology Rapid Integration & Construction Set
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ICT-2009.7.2 - Accessible and Assistive ICT
Small or medium-scale focused research project

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1   General information

These instructions will help you to install the open-source-software AsTeRICS. The installation process will be described step-by-step.

1.1   Definition AsTeRICS

„**As**sistive **Te**chnology **R**apid **I**ntegration and **C**onstruction **S**et".
With AsTeRICS, you can easily and economically build, use and adapt your efficient and individual "Assistive Technologies". The input capabilities of AsTeRICS are very flexible. AsTeRICS can be used and combined with different input-devices such as a webcam, switches or an on-screen scanning keyboard.
The various output-capabilities of the system include PC device emulation, game control, environmental control applications and utilization of embedded devices.

1.2   Definition ACS

AsTeRICS **C**onfiguration **S**uite is a graphical editor for easy building and adapting "Assistive Technologies".
For this purpose you use sensors, actuators and processors, which are included in the software. You can connect these elements and build your own individual setup (also called a "model"), which is specially adapted for your needs, easily and fast.

1.3   Definition ARE

The **A**sTeRICS **R**untime **E**nvironment is the basic software framework for all AsTeRICS applications and use-cases. The models built in the ACS will run in the ARE. The ACS can be seen as a configuration program for the ARE.

1.4   Required devices and conditions

- AsTeRICS hardware platform (http://asterics.harpo.com.pl/hardware.html)
  Or a PC / notebook with Windows XP / VISTA / 7
- Internet access

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2   Installation

An Internet connection is required during the installation.
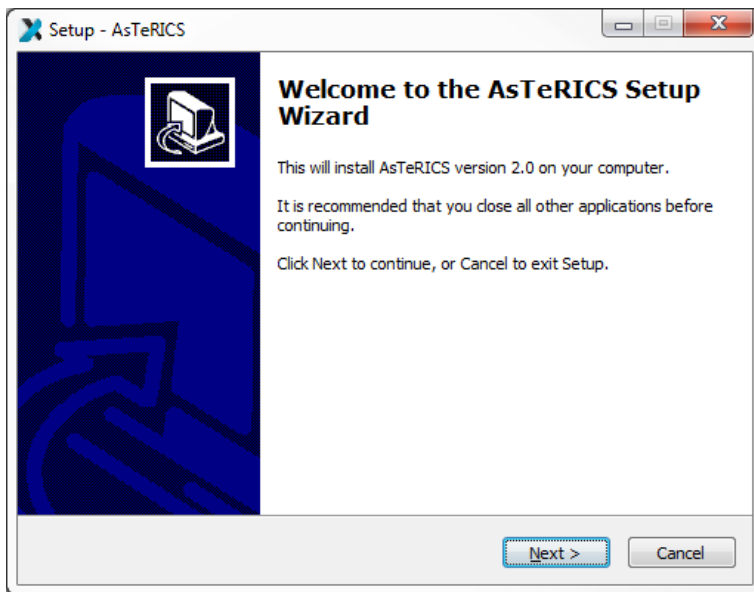
2.1   Start the installation

- Click on the following link:

  http://www.asterics.eu/download/AsTeRICS_setup.exe

and download and start the setup file.
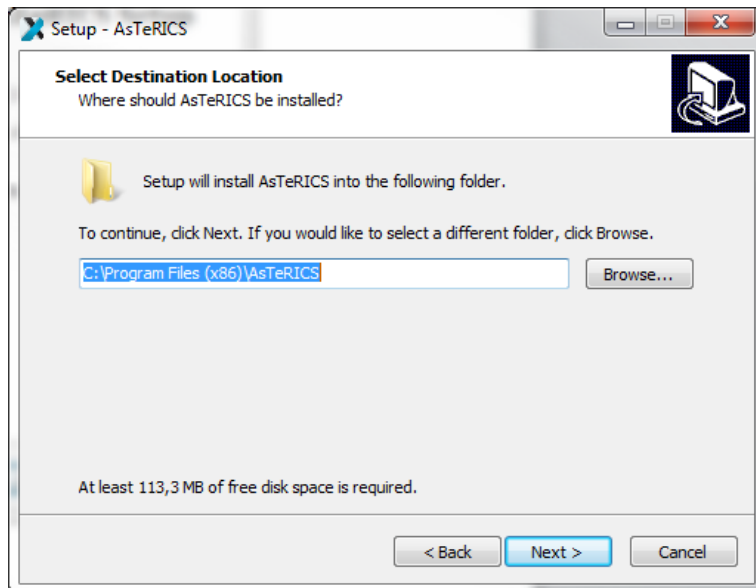
You can see the following window:

This is the welcome window. It informs you which version of the software you are installing.

- Click on the button **„Next".**

2.2   Define the installation path
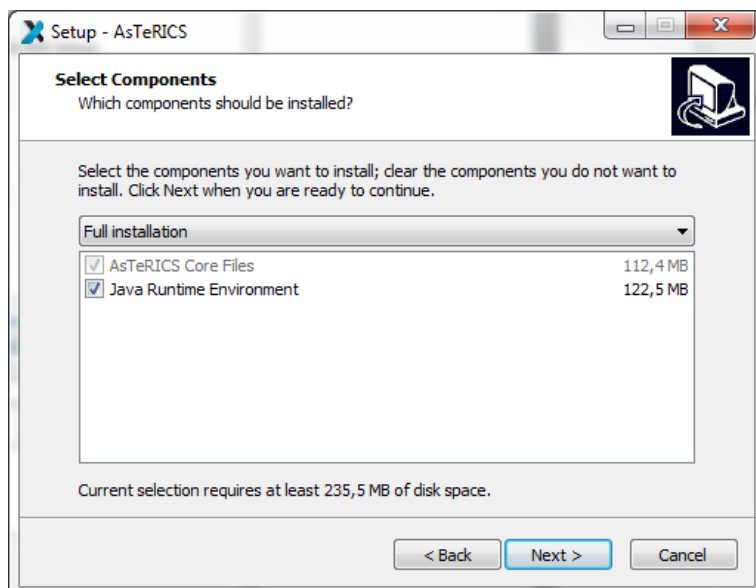
You can see the following window:

In this dialogue window you can define the installation path that means you can choose a folder, where Asterics should be installed.

Note: We suggest using the standard installation path.

- Click on the button **„Next".**

2.3   Define components
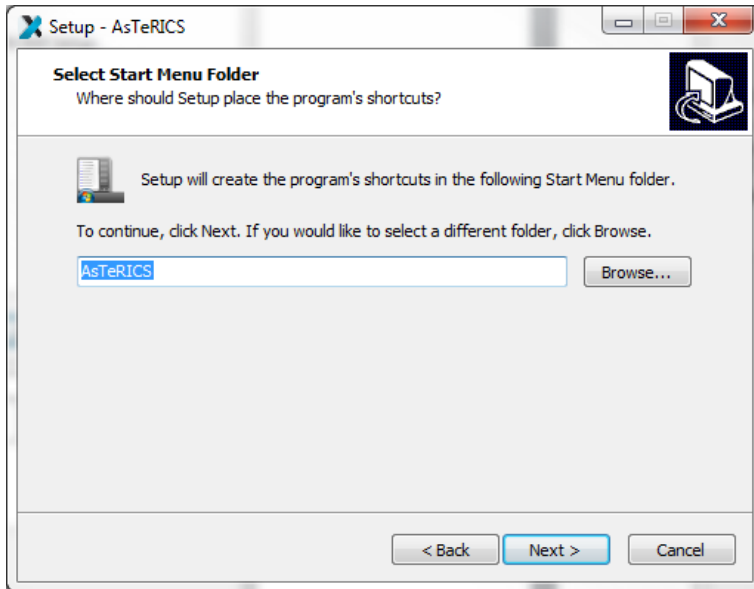
You can see the following window:

Note: AsTeRICS needs the Java Runtime Environment (32-Bit Version). If you have already installed the Java Runtime Environment on your computer, please inactivate

the box and install only AsTeRICS. (Note: you need the 32-bit version also if you use a 64-bit version of Windows)

- Click on the button **„Next".**

2.4 Define Start Menu folder entry
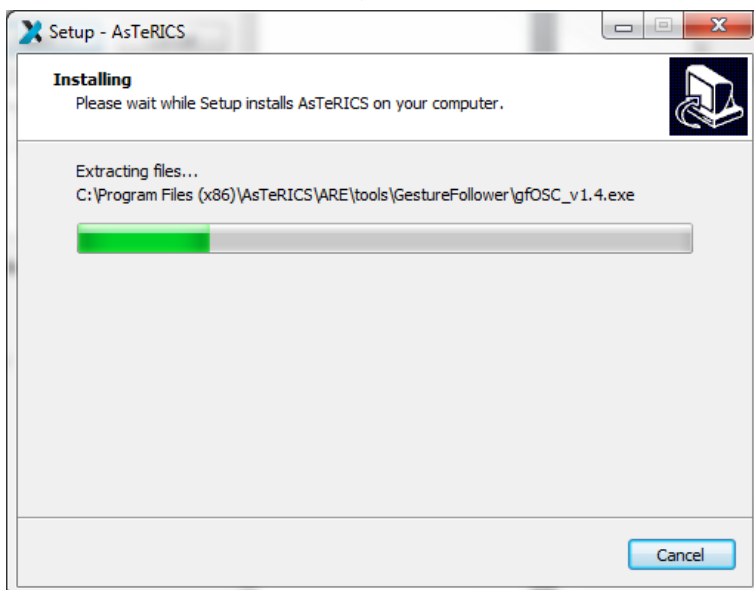
You can see the following window:

In this dialogue window you can define the name of the start menu entry.

- Click on the button **„Next".**
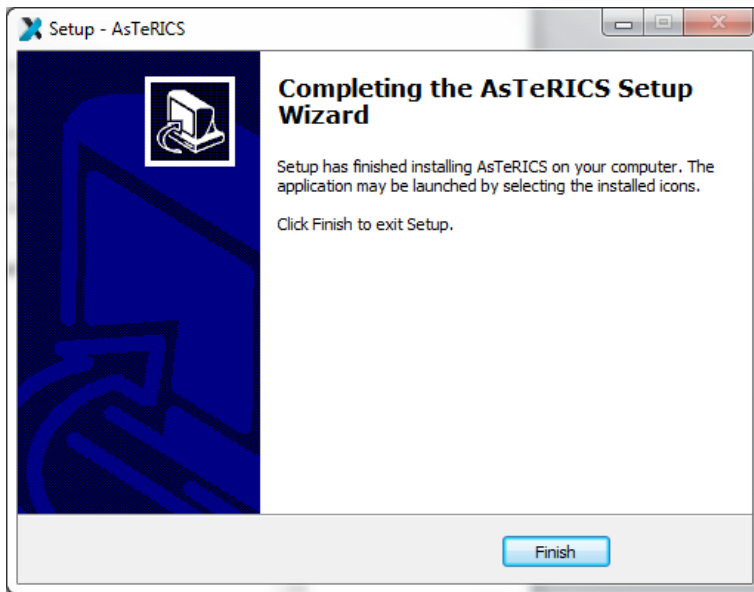
2.5 Progress of installation

You can see the following window:

In this dialogue window you can see the progress of the installation. It can take a few moments till the process is finished.

2.6   Installation finish
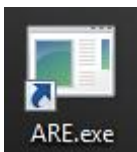
You can see the following window:

- • Click on the button **„Finish".**

You have successfully installed AsTeRICS.

2.7   Complete (check) the installation

2.7.1 Desktop

On your desktop you will find the following links:


2.7.2 Programs

Under Windows-start **„All Programs"** you will find the start folder **„AsTeRICS"** and the start-files.

1.1   Creating Models – a First Example

A model is a collection of 1 to n components, where a component represents a plugin of the ARE. These components are connected via cannels (for data connections) and event channels (representing events). The following example will illustrate the creation of a simple webcam mouse, using the position of the nose to control the cursor and opening the mouth to trigger a mouse click. This model requires a connected and installed webcam.

In a first step start the ACS and the ARE using the ACS.exe and ARE.exe files. In the ACS window select the tab '*Components'*, then '*Sensors'* and within the sensors the menu item '*Computer Vision'*. There select the component *FacetrackerLK*. The component is now on the drawing area and, if the component is selected, properties can be set (or changed) in the rightmost part of the ACS window.
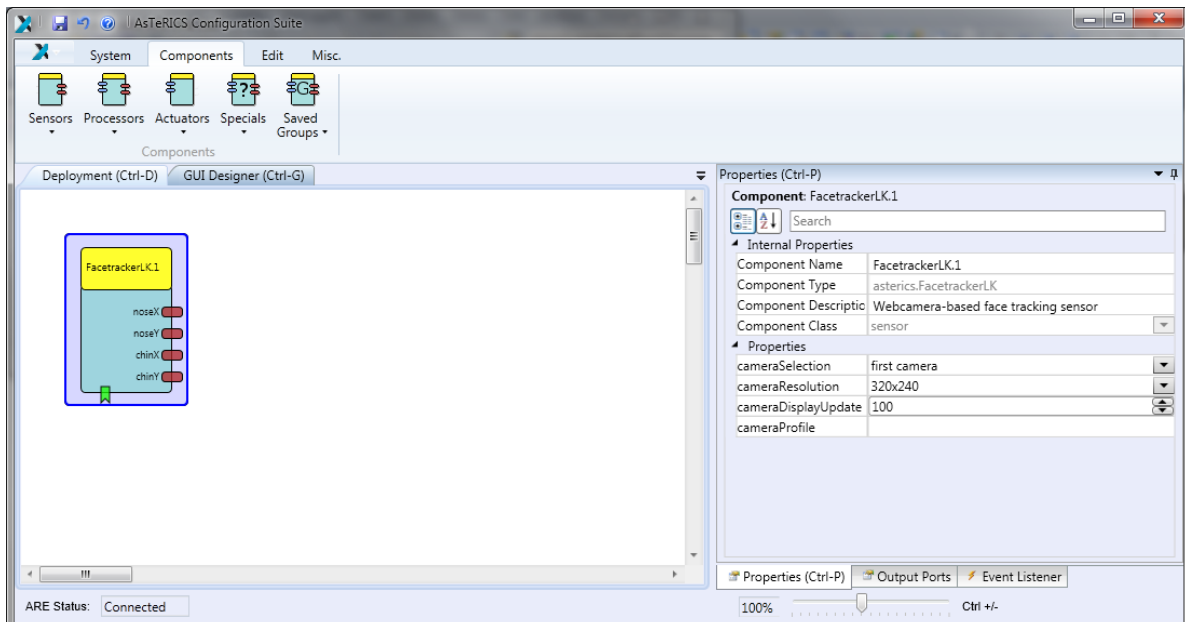

The next needed component is the '*Mouse'*, it can be found by selecting '*Actuators'* -> '*Input Device Emulation'*. After the insert, select the Mouse component and adapt the properties. Deactivate *absolutePosition* and set the *xMax* and *yMax* to your screen resolution.

In the next step, connect the *noseX* and the *noseY* outputs of the '*FacetrackerLK'* with the *mouseX* and *mouseY* inputs of the Mouse. Finally, it should look like the screenshot below.
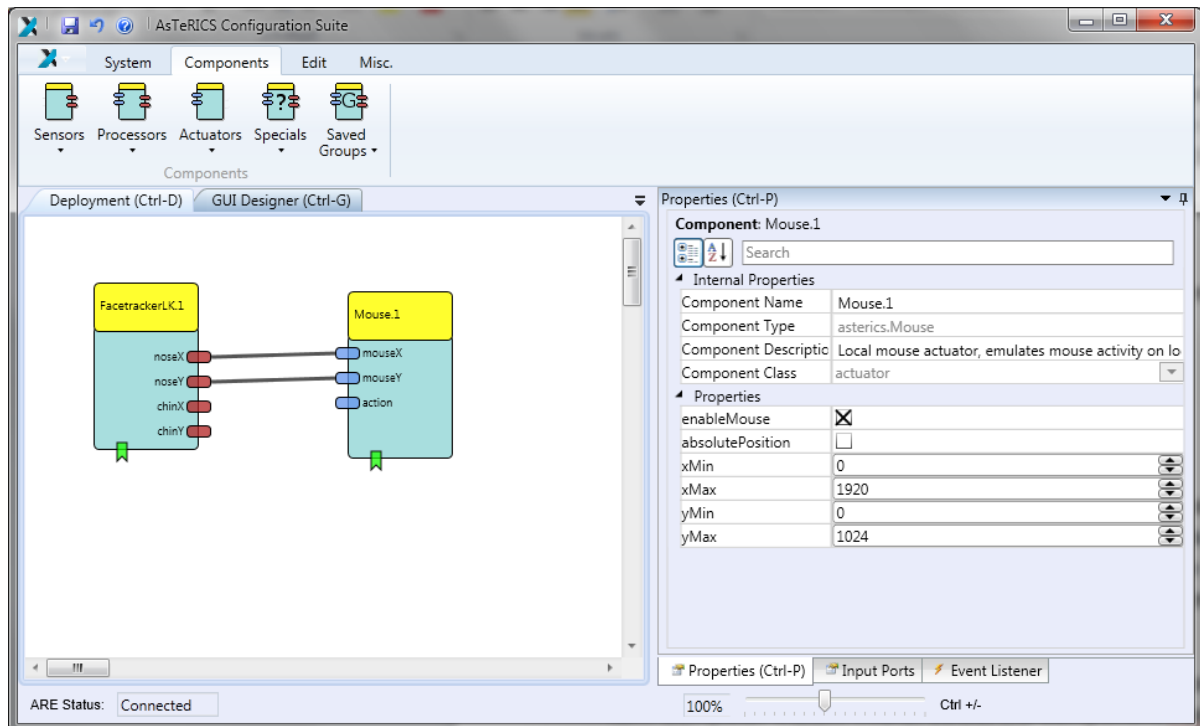
The model now would be able to use the coordinates of the nose to control the mouse cursor, but the mouse click is still missing.

For the mouse clicking functionality, we first need the '*MathEvaluator*' ('*Processors*' - > '*Basic Math*') plugin. We connect the *noseY* output of the '*FacetrackerLK*' the with the *inA* input of the '*MathEvaluator*' and likewise the *chinY* with *inB*. In the properties of the '*MathEvaluator*', we set the property *expression* to '*b-a*'.
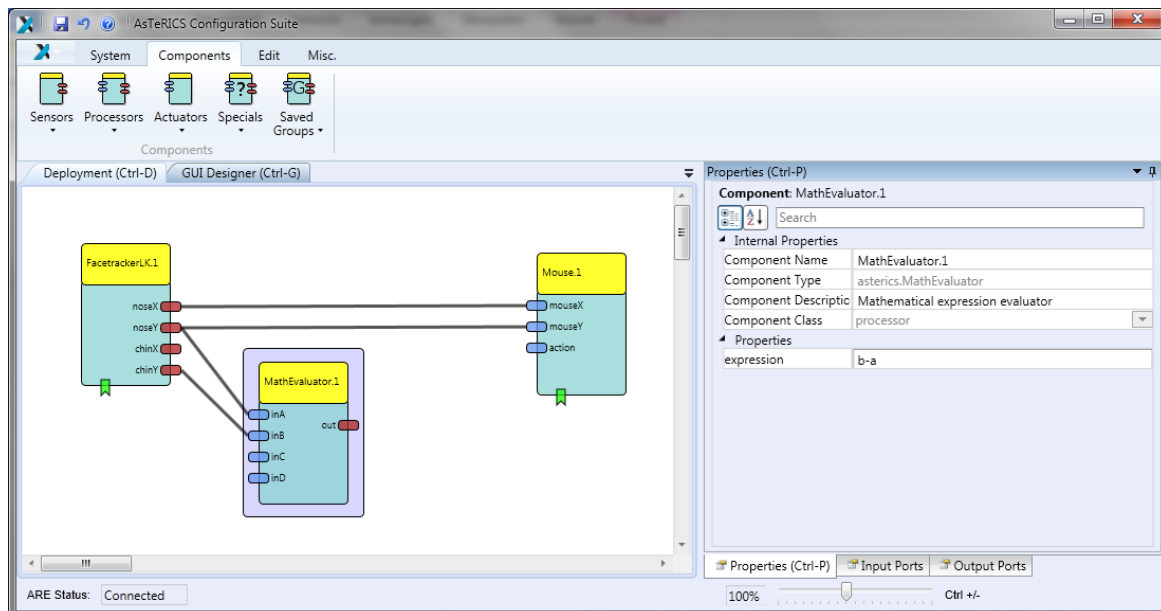

We will '*Differentiate*' ('*Processors*' -> '*Basic Math*') the *out* value to react on a fast change of the nose to chin distance.
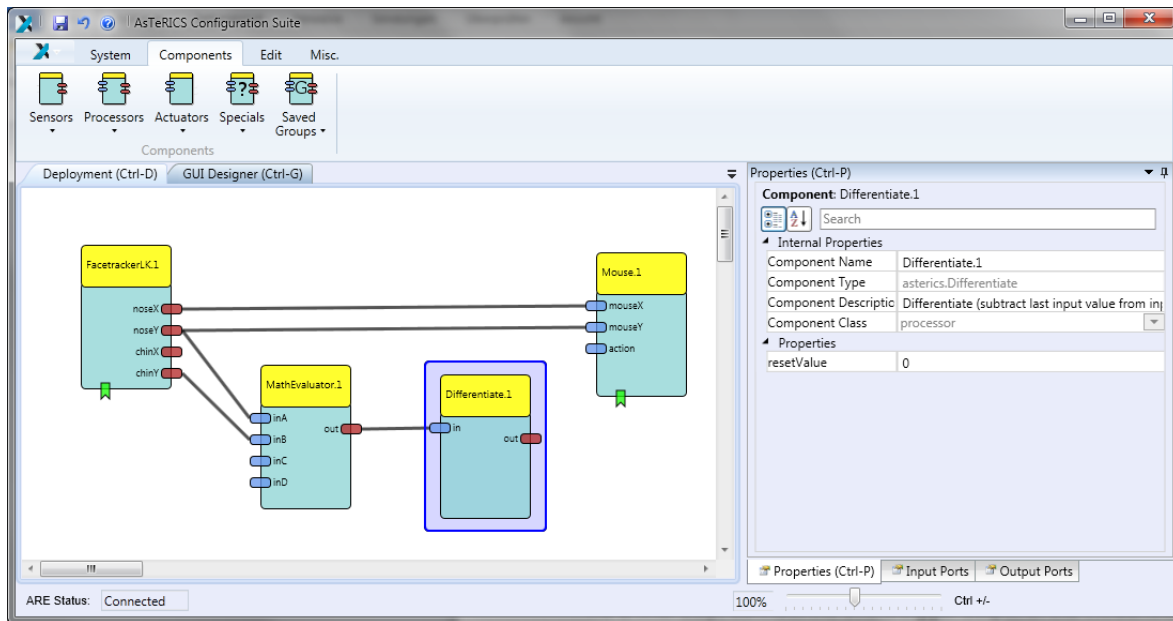
This processed value will then be forwarded to a '*Threshold*' ('*Processors*' -> '*Basic Math*') component. Set the *thresholdLow* and *thresholdHigh* values to 30.
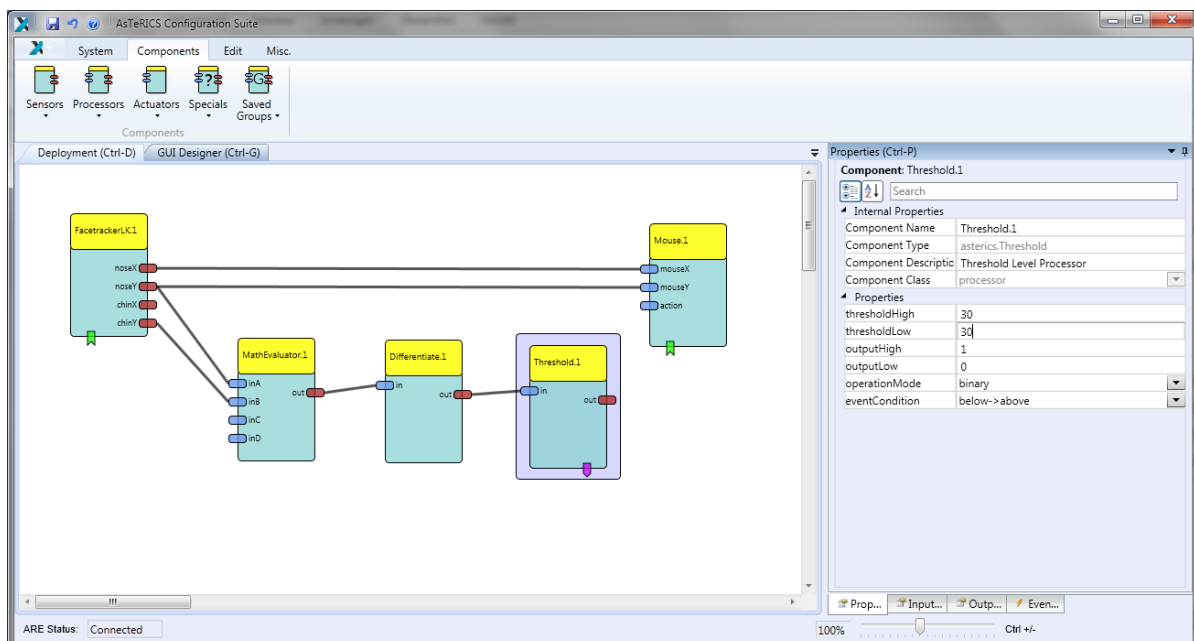
As a final step, connect the event trigger output of the '*Threshold*' with the event listener input of the '*Mouse*' – the event triggers and listeners are at the bottom of the components. After the connection has been made, set the *leftClick* to *eventPosEdge* in the property editor at the right. If everything was done right, it should look like the following screenshot:
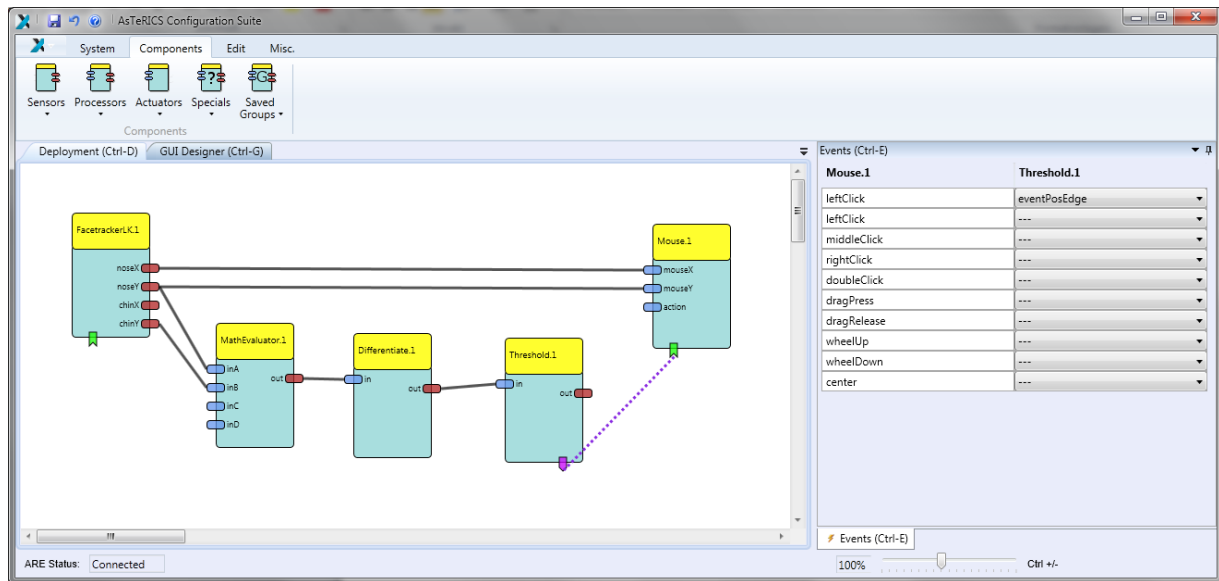
Now, upload the model to the ARE and press the '*Start Model'* button. A window with the camera screen will appear, marking with a green and yellow circle - the position of nose and chin. Press the '*Stop Model'* button or press *F7* to stop the model and get the control of the mouse back. Below is a screenshot of the system, when running.
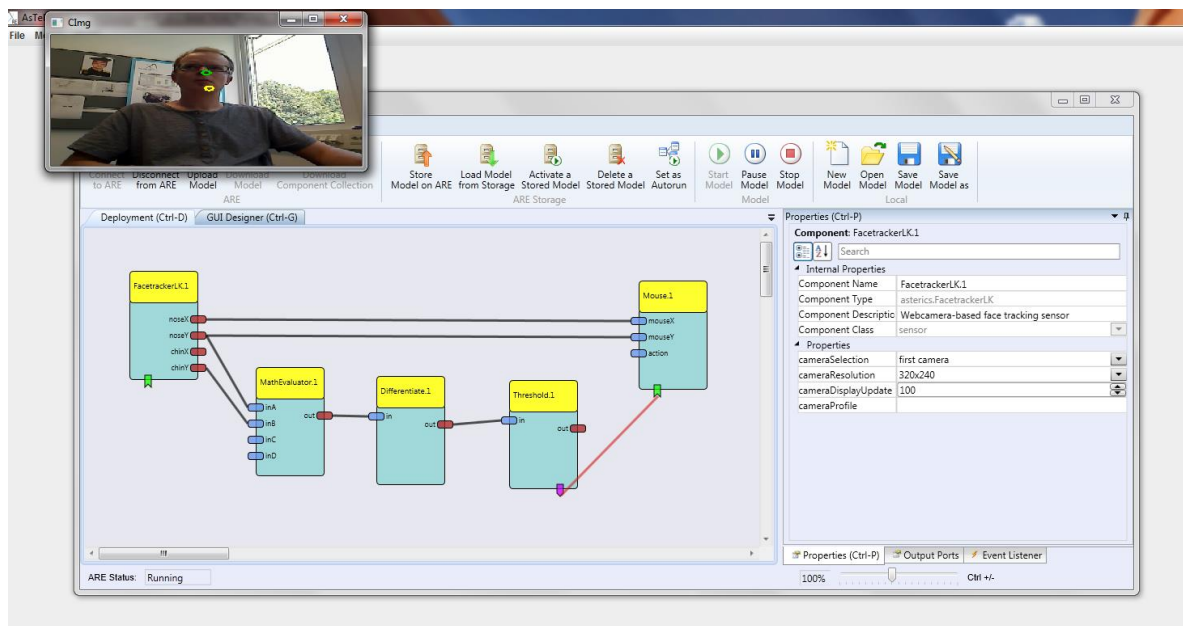
Congratulations, your first AsTeRICS model is running!

## 1.2   A first Improvement – Reducing the Tremor

You might have noticed that the mouse pointer has a tremor, because the head is always in movement to a certain extent. To reduce this tremor, an '*Averager'* ('*Processors' -> 'Basic Math'*) will be used to smoothen the X coordinates and another *'Averager'* for the Y coordinates between the '*FacetrackerLK'* and the '*Mouse'*. The *bufferSize* in the properties will be set to 5.
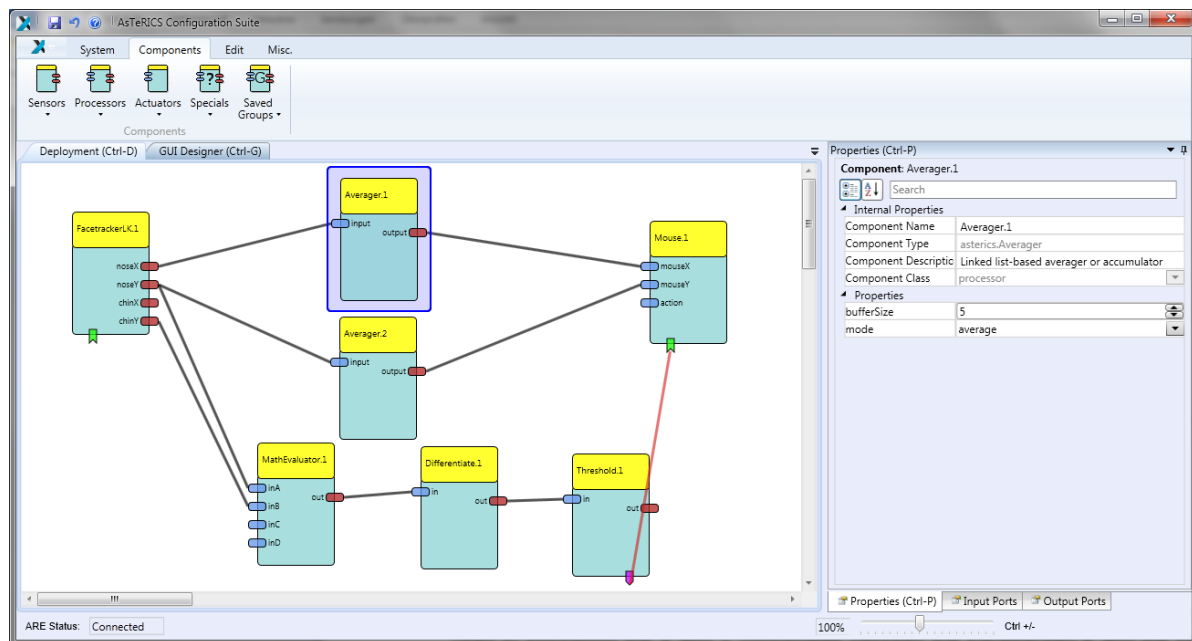
That's all, just upload the model and start it now.

1.3   Adjusting the Webcam

If you don't like the position of the webcam after starting the model, you can set a different start position. Select the '*GUI Designer*' tab above the drawing area and move the webcam window to an area, which is comfortable to you. Also the size of the window can be adjusted.
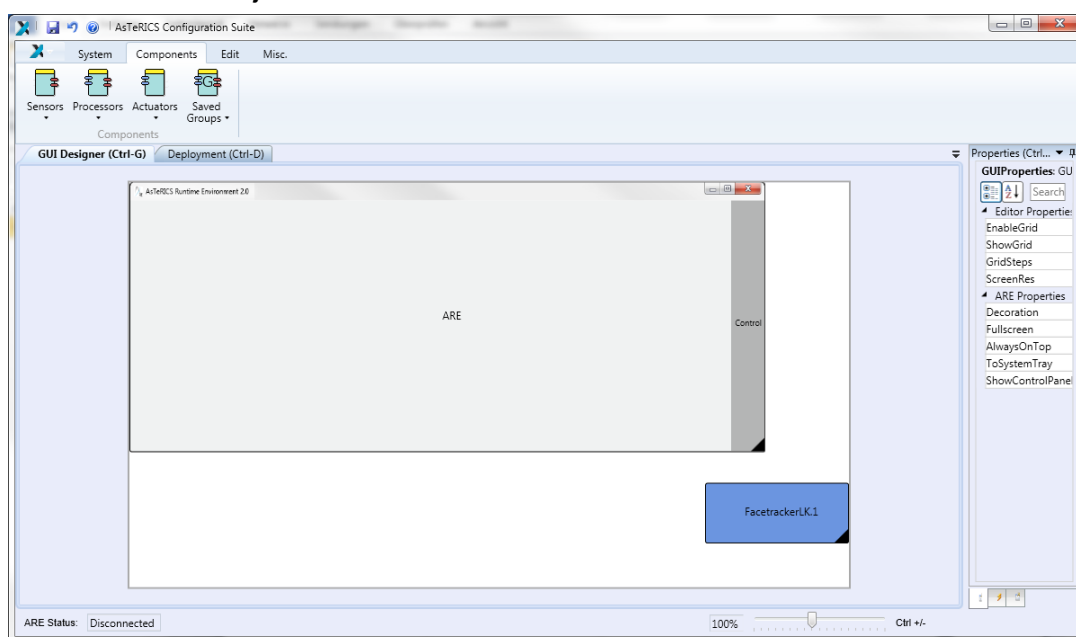
Upload and start the model to work with the changes.