

Before you can run this tutorial, you will need to download some of the dlls mentioned in the Installation Guide.pdf.

We strongly recommend to read the Alvar.ppt which comes with the ALVAR SDK (if using ALVAR) or artag_rev2.doc which comes with the ARTag SDK (if using ARTag), and run their demos to have better understanding of how ALVAR or ARTag works.

If Using ALVAR:

Make sure that you install OpenCV 1.0 as required by the ALVAR library.

Before you can run tutorial 8 with ALVAR, you will need a camera calibration file (calib.xml). Otherwise, Visual Studio will complain about the file being missing. It is not in the Tutorial 8 folder initially, so you will need to first compile ALVAR package, and run their SampleCamCalib project to generate a calibration file for your camera. Once calib.xml is generated, copy the file to Tutorial 8 folder. Now you can successfully build the project.

In order to make the tutorial work, please print out "groundALVAR.pdf" and "toolbarALVAR.pdf" and bring it to a place where the camera can see the array of ground markers (fiducials). You should see a green 3D sphere rendered on top of the center of array of markers as well as a red 3D box at one of the corner. The tracking will be more stable than holding it by your hands, if you put the print out (sheet of paper with markers) on a clip board or any type of flat rigid surface.

If Using ARTag:

The ARTag.cf file contains bunch of marker (fiducial) configurations, and you are welcome to change the configurations, but for now, please leave those as it is, otherwise, you may have some problems rendering the tracked objects. (For detailed description of the .cf file format, please see below)

In order to make the tutorial work, please print out "ground.pdf" and "toolbar.pdf" (NOTE: When you print out the PDF file using Acrobat Reader, make sure you change "Page Scaling" under "Page Handling" to be "None. Otherwise, the inch measures won't be exact as noted on the sheet) and bring it to a place where the camera can see the array of ground markers (fiducials). You should see a green 3D sphere rendered on top of the center of array of markers as well as a red 3D box at one of the corner. Once you bring the toolbar1 marker to a place where the camera can see, you will see that the red 3D box is now rendered on top of the toolbar1 marker. For this simple demo, it uses 24 (6x4) markers. The more markers you use and the larger the size of the marker is, the more stable the tracking will be. Also, if you put the print out (sheet of paper with markers) on a clip board or any type of flat rigid surface, the tracking will be more stable than holding it by your hands.

ARTag Configuration (.cf) File Format:

- An array of markers starts with the a tag 'coordframe' and ends with a tag '/coordframe'
- Each array of markers is assigned a name with the following syntax: name="array_name"
- Each marker definition starts with a tag 'marker' and ends with a tag '/marker'
- Each marker is assigned a predefined ID with the following syntax: id=number

- Each marker defines the 4 corners of the marker. Each point has 3 coordinates, but the 3rd coordinate (z coordinate) has to be always 0. (If you change it to a nonzero value, it won't work!!). The number can be a floating point.
- Note that you can't have duplicated marker (marker with same ID) defined in one .cf file. If you duplicate a marker, the newer definition (whichever comes after is the newer definition) will overwrite the old one, so it will mess up the array which has the old definition.

Creating and using your own marker arrays

In order to use your own marker arrays, you will need to create both the marker array image and configuration file for both ALVAR and ARTag. We provide a tool, MarkerLayout, in the *tools* directory to make this process much easier, so we strongly recommend using this tool instead of creating those files manually which can be time consuming and error prone.