

CS684 Documentation



CS684 – 2010 Project

Vector Image extraction and Autonomous Duplication by Firebird V

Project: Vector Image extraction and Autonomous Duplication by Firebird V
Students:

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Project Objective

The project is aimed at implementing a system which can extract a vector image from a raster image and draw the same autonomously on a chart paper. The whole project will be open-source and the code is being implemented using coding standards and standard naming conventions. The code of the Visual Studio will be reusable, readable and portable. The AVR Studio code will be readable and reusable but not portable to other Microcontrollers. The hardware requirements are strict. The software requirements for the Visual Studio are strict. But for Microcontroller code, the IDE is not mandatory but the specific compilers and programmer is required.

Hardware Platform

Webcam:

- Capable of capturing RGB image.
- Capable of capturing images of resolution 640x480.

ZigBee module:

- Connected to ATmega 2560 through RxD0/PE0 (pin 2) and TxD0/PE1 (pin 3)
- Connected to the serial port of the computer
- AVR ISP mkII for programming the microcontroller
- Firebird V robot mounted with servo motors and a marker attached to it

Software

1. Microsoft Visual Studio 2008:
2. OpenCV: for image acquisition and image processing and displaying
3. AVR Studio 4 : IDE for programming AVR micro-controllers

Code Description

Code Files.

Filename	Purpose	Executes on
Main.cpp	Main Program	PC
point.h	Defines a 2D point class	PC
operations.h	Defines image processing functionalities like thinning thresholding etc	PC
vector_extract.h	Defines functionalities to extract vector path from the thinned image	PC
includes.h	Specify all your includes in this file.	PC
serialcomm.h	Defines serial communication functionalities	PC
project.c	Sends data and receives and executes instructions from PC	FireBirb V

Deliverables

Filename	Contains	
source_code.zip	SourceCode of programs to be burnt on Robot. Contains documentation of the code as well.	
Documents.zip	Contains doc files (docs_VC – documentation for the Visual C++, docs_FBV – documentation for project.c)	

Execution Instructions

1. After compiling project.c to hex, burn on FireBird V.
2. Open the visual studio solution in VC++
3. Mention the correct COM port of serial communication in line number 73 of file :
Final_project/CS684_course_project_group5/serialcomm.h
4. Run the application/ Debug. On execution of that project it will capture an image through the web-cam connected to its usb port.

NB: OpenCV library needs to be installed on Windows and the project should be linked correctly to the installed libraries.
