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BBAR v.1.2.00

Bingo Balls Automatic Reader

Technical Manual

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Software Integration

The Neural Labs BBAR (Bingo Balls Automatic Recognition) software is released as a Windows Dynamic Link Library (DLL). This makes very simple the integration of our library with our customers' software.

In order to integrate BBAR, the user must:

- Copy the supplied **BBAR.dll** into the **C:\WINDOWS\SYSTEM32** directory of the computer where the software will be running.
- Copy the DLLs included in the **Support** folder of the CD into the **C:\WINDOWS\SYSTEM32** directory of the computer where the software will be running. These DLL files are used by BBAR.dll.
- Copy the complete **OCR** folder included in the CD into the **working folder** of the application that will be using the DLL.
- There are also included in the CD:
 - o Header (.h) and Library (.lib) files to link the BBAR Library to any Microsoft Visual C++ or Borland C++ project.
 - o Declaration module (.bas) to use BBAR from Microsoft Visual Basic.
 - o DLL Function Reference Manual.

If further technical support is required, Neural Labs will be pleased to help with the integration of BBAR. For support queries, email us at support@neurallabs.net

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Hardware Integration

These are the hardware components that are required in order to setup a Bingo Balls Automatic Recognition System:

- **Camera.** A minimum resolution of **384 x 288 pixels** is recommended. It is very important that the images acquired are sharp, well balanced with good brightness and contrast and distortion-free.
- **Illumination.** Lighting is a critical factor for any artificial vision system. For this application light must comply with the following:
 - o Light must be uniform all over the scene.
 - o Light must be diffused, without any glares or shadows.
 - o High frequency AC or DC powered lights must be used.

The main goal is to achieve an image of the ball without any bright glares and without any shadows.

Most of our customers use a high frequency fluorescent ring light with a diffuser plate.

- **Acquisition Board.** In order to connect the camera to the computer an imaging device will be required. Most of the image acquisition boards are sold with a software library or SDK that allows the user to capture images and obtain the buffer. Our BBAR software can process images directly from the image buffer or from a BMP file.
- **Digital I/O.** The software will need to know when to acquire an image. Usually a "Ball In Place" signal is connected to the computer thru a digital I/O board (some image acquisition boards include digital I/O signals). A sensor in the bingo machine will generate this signal every time that a ball is located in the correct position.

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Image Examples

Here are some examples of images from real world systems:

