



MAEER'S
MIT COLLEGE OF ENGINEERING PUNE

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DEPARTMENT OF
ELECTRONICS AND TELECOMMUNICATION

SYNOPSIS ON PROJECT
“WIRELESS IMAGE TRANSMISSION AND PROCESSING”

SUBMITTED BY

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INTRODUCTION

In this era of technology to boost the productivity each and every industry trying to be automated. Automation requires for reducing the cost and time to manufacture each product. Automation also guarantees the accuracy and quality of product.

In this point of view we are implanting one new application of automation to reduce manual work and failure rate during manufacturing process. In this application we are capturing the image from manufacturing field of product. Then this image is digitized and transfer from one divisional section to other in purpose of decision making. We are transferring this image wirelessly to reduce total cost and to make it more flexible. This wireless Image transmission is done using ZIGBEE PROTOCOL (IEEE 802.15.4 std.). After successful reception of image, image is processed to collect the attributes in it which helps in decision making. These attributes are collected using Digital Image Processing Techniques.

BLOCK DIAGRAM

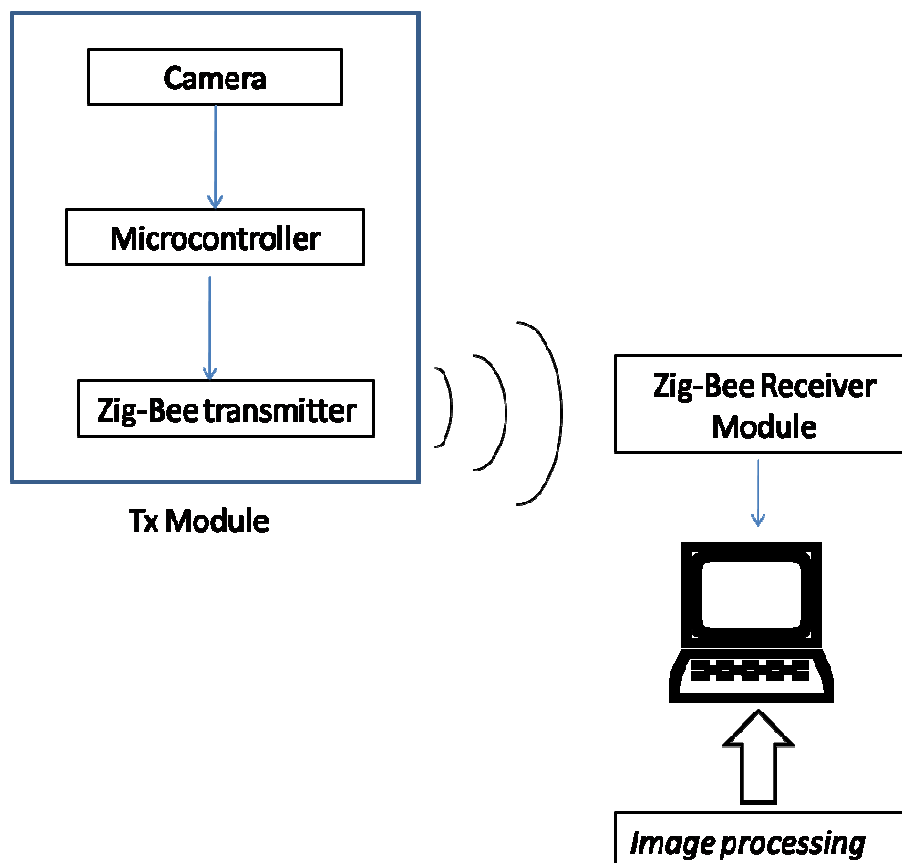


Fig. Wireless image transfer using zigbee and image processing.

- **ZigBee Protocol (IEEE 802.15.4 Std)**

ZigBee is a specification for a suite of high level communication protocols using small, low-power digital radios based on an IEEE 802 standard for personal area networks. ZigBee is LR-WPAN type network. It is a simple, low-cost communication network that allows wireless connectivity in applications with limited power and relaxed throughput requirements.

- **The main objectives of an LR-WPAN are:**

1. Ease of installation
2. Reliable data transfer
3. Short range operation
4. Extremely low cost
5. Reasonable battery life
6. Simple and flexible protocol.

- **ZigBee/IEEE 802.15.4 Protocol Characteristics:**

1. Dual PHY (2.4GHz and 868/915 MHz)
2. Data rates of 650kbps (@2.4 GHz), 40kbps(@915MHz), and 20kbps(@868MHz)
3. Multiple topologies: star, mesh, peer to peer
4. Optional guaranteed time slot for applications requiring low latency
5. Range: 50m Typical (5 to 500m based on environment)
6. Address space up to:
 - 18,450,000,000,000,000 devices (64 bit IEEE address)
 - 65,535 networks

- **Digital Image Processing**

In electrical engineering and computer science, image processing is any form of signal processing for which the input is an image, such as a photograph or video frame; the output of image processing may be either an image or, a set of characteristics or parameters related to the image.

It allows a much wider range of algorithms to be applied to the input data and can avoid problems such as the build-up of noise and signal distortion during processing. Since images are defined over two dimensions (perhaps more) digital image processing may be modeled in the form of Multidimensional Systems.

ALGORITHM

1. Capturing an image with the help of camera present.
2. Convert that image into digital format i.e. suitable for transmission.
3. Transferring this digitally formatted image using ZigBee Protocol (ZigBee Transmitter).
4. Receiving the transferred image using ZigBee receiver module.
5. Interfacing of ZigBee receiver module with to computer.
6. Processing of captured image using Image Processing Techniques.
7. Taking decision according to image attributes.

APPLICATION

- Consider one refrigerator plant where all refrigerators are manufactured. In this refrigerator plant there are different sections where different components of refrigerator are manufactured and assemble. If we consider door assemble section where doors are attached to respective refrigerator, before attachment of door lock, handle and stickers of respective brand are fitted on door. So in this section we can use this project to check all these element are on its designated place or not. First of all, we sent image of door to processing section wirelessly where this processor is fitted to check these entire elements place.
- Same as above, we can also use this project to check dimension, size, shape etc. of elements different section with only one processor which is built-in processing section by sending image wirelessly.
- This project can be used in many different industries e.g. Automobile Industry, Bottle filling plant, Toll booth, TV manufacturing plant, washing machine manufacturing plant, etc.

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