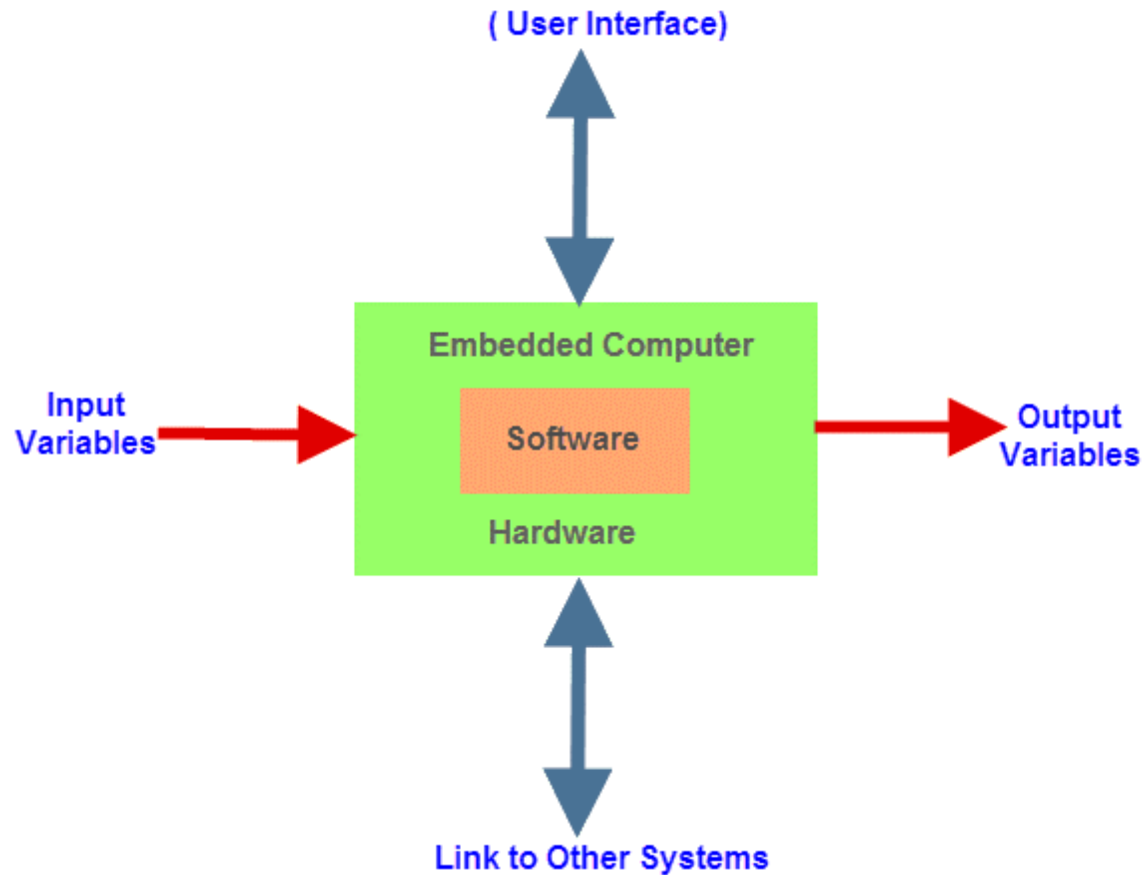# Introduction to Embedded System
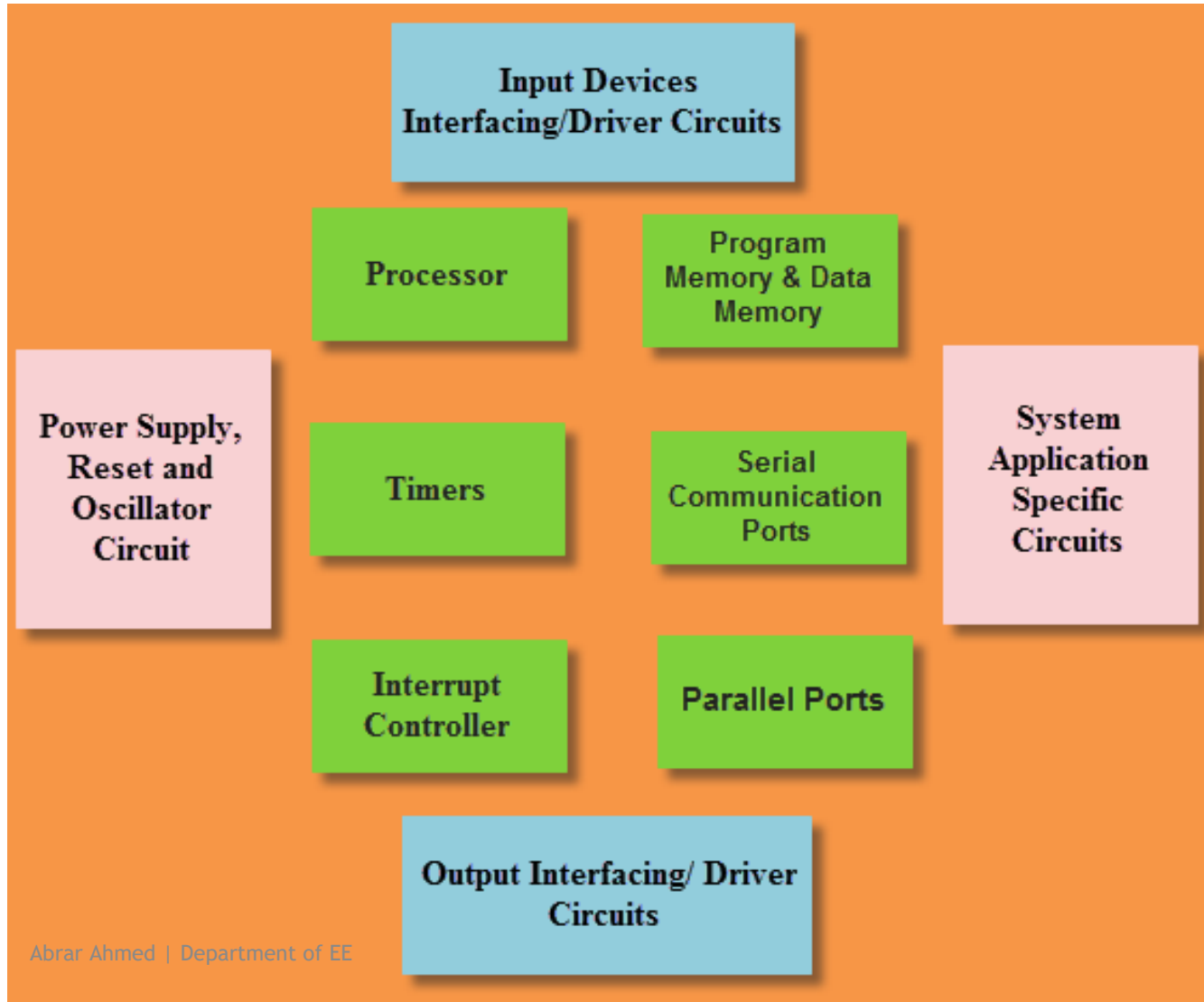
IoT and Robotics Club

What is Embedded System?

- An embedded system is one kind of a computer system mainly designed to perform several tasks like to access, process, store and also control the data in various electronics-based systems.

- Embedded systems are a combination of hardware and software where software is usually known as firmware that is embedded into the hardware.

Embedded System

(User Interface)

Input Variables → Embedded Computer → Output Variables

Embedded Computer

Software

Hardware

Link to Other Systems

Embedded System Basics

Input Devices Interfacing/Driver Circuits

Processor

Program Memory & Data Memory

Power Supply, Reset and Oscillator Circuit

Timers

Serial Communication Ports

System Application Specific Circuits

Interrupt Controller

Parallel Ports

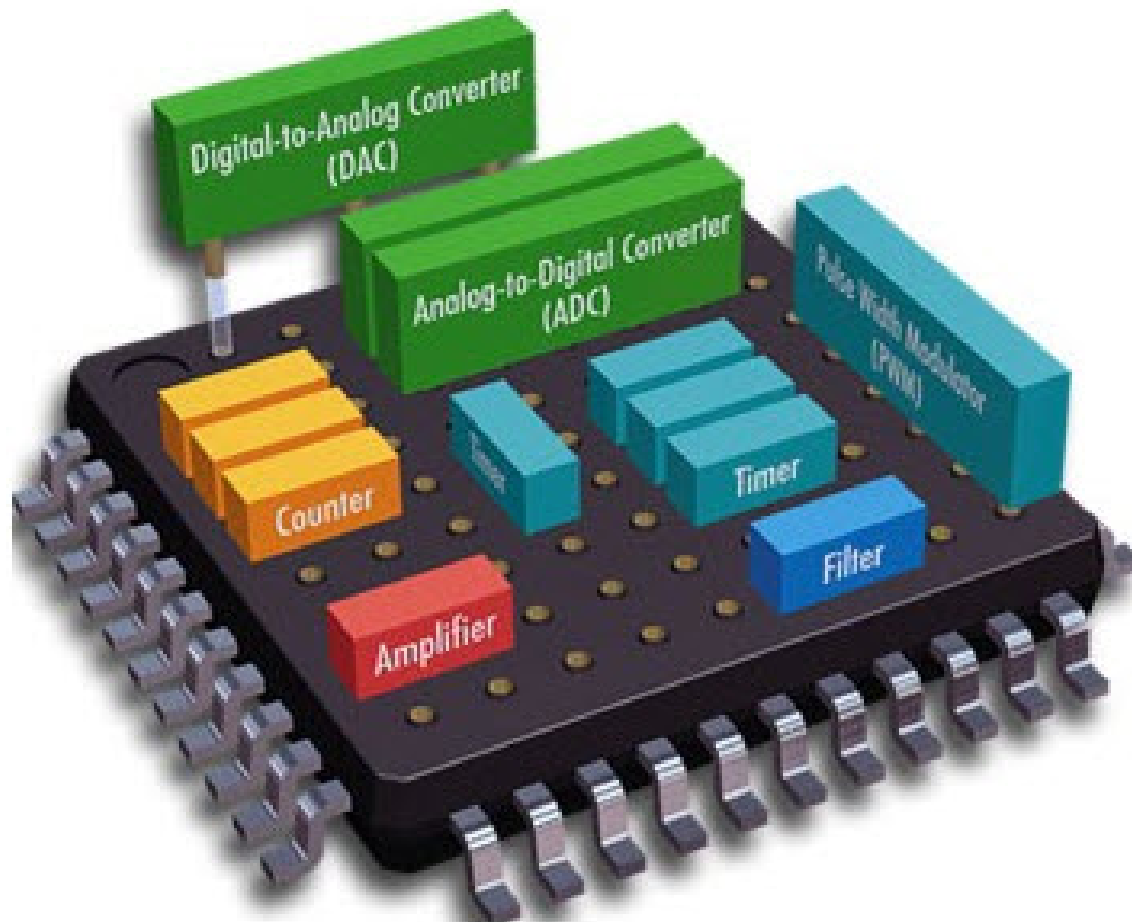**Output Interfacing/ Driver Circuits**

Abrar Ahmed | Department of EE

Embedded System Hardware

An embedded system uses a hardware platform to perform the operation. Hardware of the embedded system is assembled with a microprocessor/microcontroller.

- Power Supply

- Memory

- Processor

- Timers

- Output/Output circuits

- Serial communication ports

- SASC (System application specific circuits)

Embedded System Hardware

Embedded System Software

▶ The software of an embedded system is written to execute a particular function.

▶ It is normally written in a high-level setup and then compiled down to offer code that can be stuck within a non-volatile memory in the hardware.

Embedded System Applications

Embedded System Applications

▶ Automobiles include motor control, cruise control, body safety, engine safety, robotics in an assembly line, car multimedia, car entertainment etc.

▶ Telecommunications include networking, mobile computing, and wireless communications, etc.

▶ Smart cards include banking, telephone and security systems.

▶ Satellites and missiles include defense, communication, and aerospace

Embedded System Applications

- Computer networking & peripherals include image processing, networking systems, printers, network cards, monitors and displays

- Digital consumer electronics include set-top boxes, DVDs, high definition TVs and digital cameras

Projects

- IOT Based Energy Meter Reading Through Internet

- Patient body temperature monitoring remotely using Internet of Things (IOT)

- Power saver for street light using high sensitive LDR managed by Arduino

- GSM based prepaid energy meter

- A notice board display system using voice commands using an Android phone

- Home automation using voice commands