4.2 MICROPROCESSOR BASED CONTROL OF PMSM
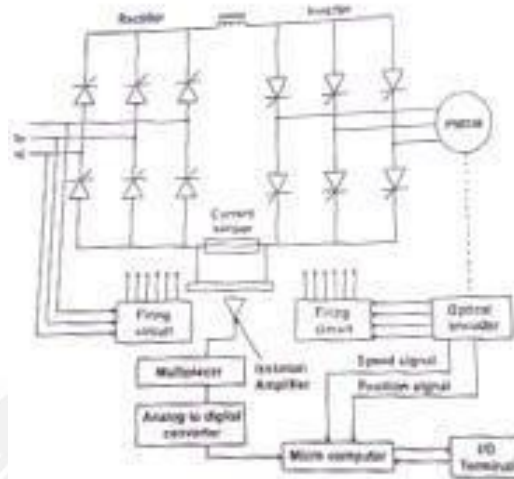

Figure 4.2.1 Microprocessor Based control of PMSM motor
[Source: "special electric machines" by Srinivasan page:5.47]

Fig 4.2.1 shows the block diagram of microprocessor based permanent magnet synchronous motor drive. The advent of microprocessor has raised interest in digital control of power converter systems and electronics motor drives since the microprocessor provides a flexible and low cost alternative to the conventional method.

For permanent magnet synchronous motor drive systems, microprocessor control offers several interesting features principally improved performance and reliability, versatility of the controller, reduced components and reduced development and manufacturing cost. In the block diagram of the microprocessor controller PMSM shown in fig 5.15, the permanent magnet synchronous motor is fed from a current source d.c link converter system, which consists of a SCR invertor through rectifier and which is operated from three phase a.c supply lines, and its gating signals are provided by digitally controlled firing circuit.

The optical encoder which is composed of a coded disk attached to the motor shaft and four optical sensors, providing rotor speed and position signals. The invertor triggering pulses are synchronized to the rotor position reference signals with a delay angle determined by an 8-bit control input.