



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution



Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A+' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF MECHANICAL ENGINEERING

19MEE403 - Industrial Digitalization

IV YEAR / VII SEM

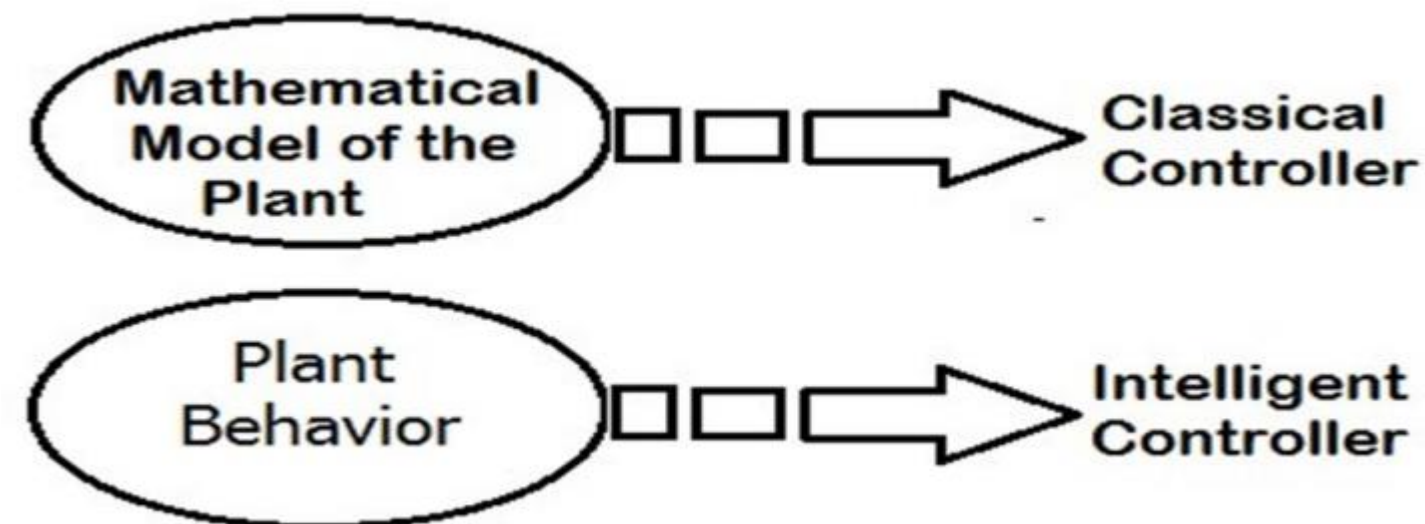
UNIT 4 - INDUSTRY 4.0



WHY INTELLIGENT CONTROL SYSTEMS?



- Control systems theory has always been at the heart of Mechatronics.
- Many control methods have been developed, each has its own advantages and disadvantages.
- Control methods can be divided into two categories:
 - Classical Control; obtain a model of the plant to be controlled!
 - Intelligent Control; does not need to know all about the plant to be controlled.
- Mechatronics are complex systems.





CLASSICAL AND INTELLIGENT CONTROL



For classical control, the designer must model the plant and therefore the intelligence (or knowledge) lies with him. The intelligence is shifted towards the designer. □ For intelligent control, the software abstractly models the plant and therefore the intelligence (or knowledge) lies with it. The intelligence is shifted towards the software.





CLASSICAL AND INTELLIGENT CONTROL



	Classical Control	Intelligent Control
Basic Concept	Mathematical Modeling - Designer designed the system which includes system dynamics	Abstract Modeling - Designer input the behavior to the system and then system attempt to abstractly define the system
Characteristics	Need to know prior information about the system dynamics	Does not need to know all about the system dynamics and conditions
	Suitable for system that can be easily model	Appropriate for complex system
Examples of Methods	Open loop system	Fuzzy logic
	Closed loop system	Artificial Neural Network
	System Modeling	Genetic Algorithm
		Support vector machine



TYPES OF VIRTUAL MODELS IN CYBERSECURITY



1. Definition of intelligent systems:

Intelligence is a mental quality that consists of the abilities to; learn from experience, adapt to new situations, understand and handle abstract concepts, and use knowledge to manipulate one's environment.

1. Design of Intelligent Control Systems:

- The study of intelligent control systems requires;
- defining some important expressions that clarify these systems,
- understanding the desired application goals, and also
- understanding different tools of soft computing.
- Several software development platforms are used for developing intelligent control systems.

The LabVIEW is one of the most important software platforms used by researchers for developing engineering applications and could be connected with different hardware systems, as well as running standalone programs for simulating the controller's performance (validating the controller by simulation then implementing it). In addition, LabVIEW is a graphical program that is very easy to learn.



Thank You

