

Magnetic Levitation System (MLS) has been receiving increasing attention in recent years. It has numerous practical applications in many practical engineering systems such as high speed maglev trains which are being used in Japan and Germany, frictionless bearings, vibration isolation of sensitive machinery, levitation of wind tunnel models, aerospace shuttles, etc. MLS controls the magnetic field generated by an electromagnet to levitate a ferromagnetic ball in midair. With an appropriate controller in the loop, the small magnet levitates in the air indefinitely without any disturbance. Its significance lies in the fact that it eliminates energy losses due to friction. The MLS can be classified into two categories viz. Attractive Systems and Repulsive Systems based on the source of levitation forces. The MLS is one of the classical experimental set ups to illustrate some of the analysis and design methods in control system education. The system is highly non linear, open loop unstable and extremely challenging to control.



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Robust Control of MIMO System

control of MIMO



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Food Additive Toxicology

With the increasing amount of pollutants present in the environment, several other physical pollutants have been impacting the quality of food adversely. There are several unknown naturally occurring contaminants that find their way into food. The most ominous are products of mold growth called mycotoxins, which include carcinogenic aflatoxins. On the other hand, more than 2500 chemical substances are added to foods to modify or impart flavor, color, stability, and texture, to fortify or enrich nutritive value, or to reduce cost. In addition, an estimated 12,000 substances are used in such a way that they may unintentionally enter the food supply. The book "Food Additive Toxicology" has been designed and structured in such a way that it would help the students gather knowledge about all those additives that are being used to adulterate the food and cause harm to human health. This book will help students understand that food additives are generally not consumed directly; rather, they are added to food intentionally to augment its processing or to improve aroma, color, consistency, taste, texture, or shelf life. Additives are not considered "nutritional" even if they possess nutritive value. The purpose of the book is to give an overview of certain risks that humans take while consuming food additives and certain problems that humans experience after consuming food additives. There is a plethora of information that opens a large field of applications to work on. This book intends to identify and come up with the best solution that is useful in dealing with those additives that are harmful to human health. As it is defined in the book, "Toxicity classification is generally concerned with the classification of compounds based on their toxicity and their most important toxic effect. The compounds that have acute toxicity can be categorized into different categories such as allergenic, carcinogenic, neurotoxic, and several other compounds." The information could be used to classify the compounds in such a structured way that a rating chart could be easily prepared to evaluate the compounds and measure the toxicity level. This will help in having a clear perception of food additives and their toxicity. The subject of the book starts from providing a clear picture of several types of additives that are used in processed foods and about global regulations that have been framed against the usage of these harmful food additives.

The book further talks about the 12 most dangerous food additives and the ways that must be adopted to avoid using such additives. The most interesting part of the book comes when it talks about the differentiation between the artificial and natural flavor of additives that are used in food. The next focus has been moved towards the clinical evaluation of the additives, where both qualitative and quantitative methods have been discussed descriptively. An attempt has been made to identify and estimate the synthetic food colors present in several food products. Some sections would highlight technological innovation in the information resources in toxicology and the application of information resources in toxicology. This book will help to identify the core areas of additives and toxicology and their harmful impact on human health.



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