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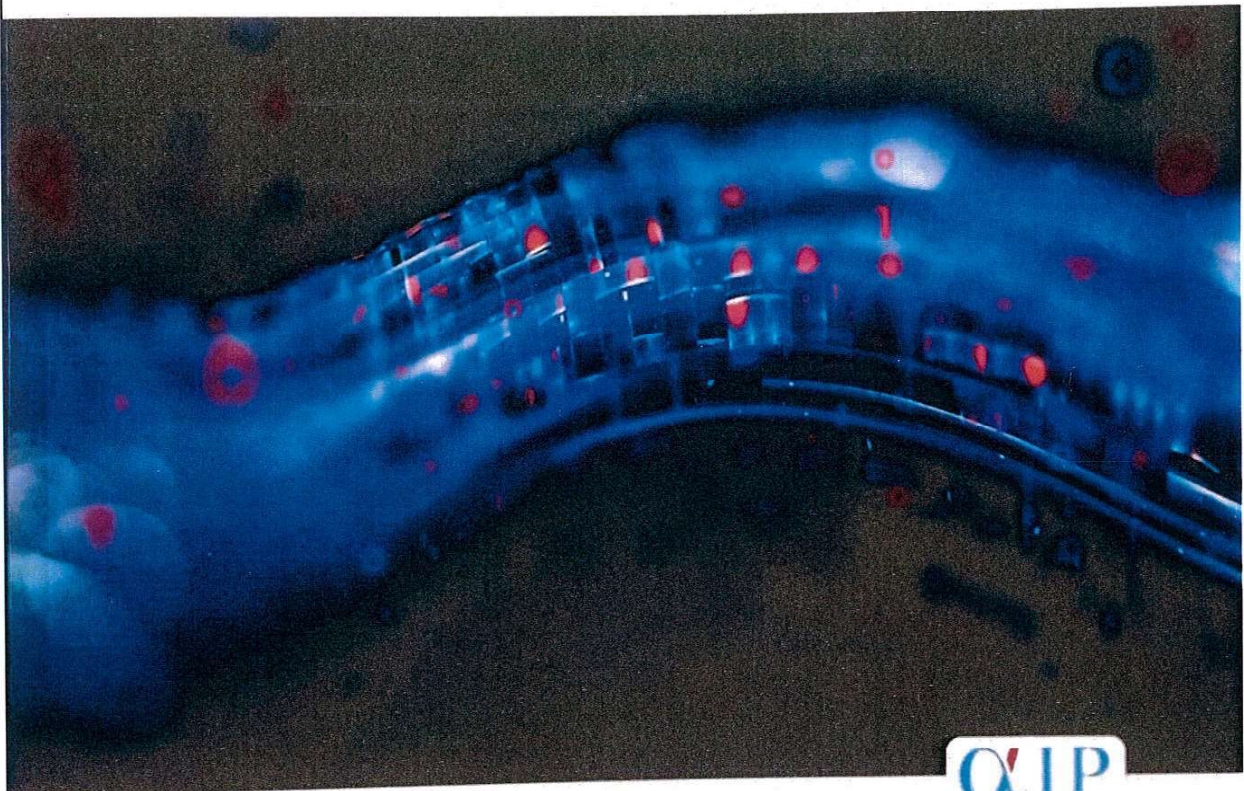
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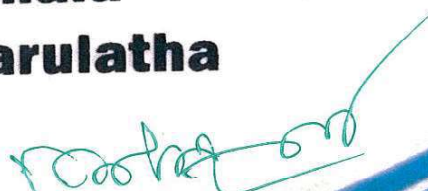


SIGNALS AND SYSTEMS



α IP

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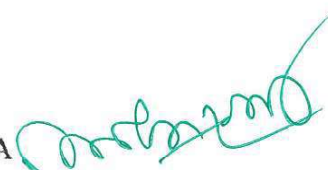

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By Authors

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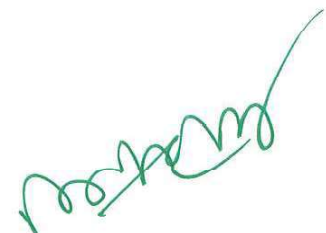
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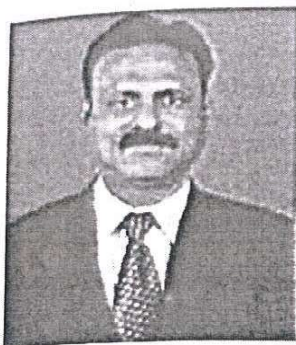
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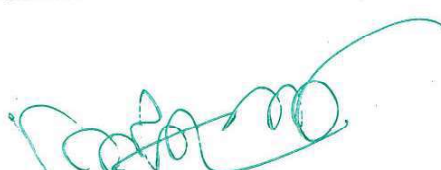
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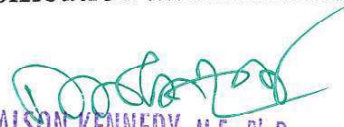
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INFORMATION AND CYBER SECURITY

Information and Cyber Security

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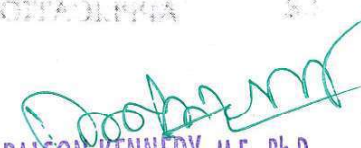
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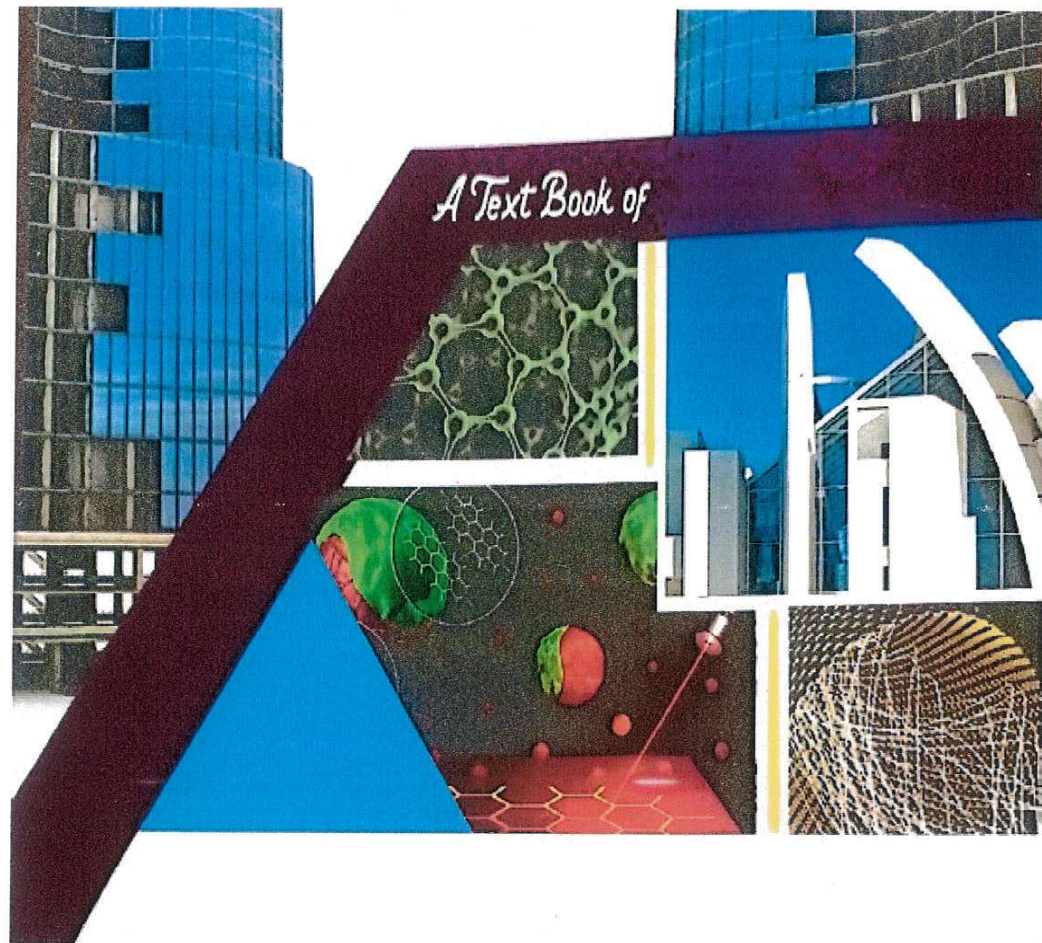
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COMMUNICATION THEORY



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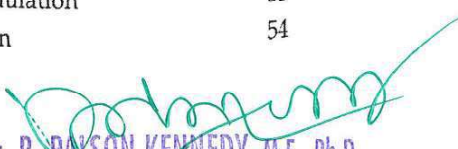
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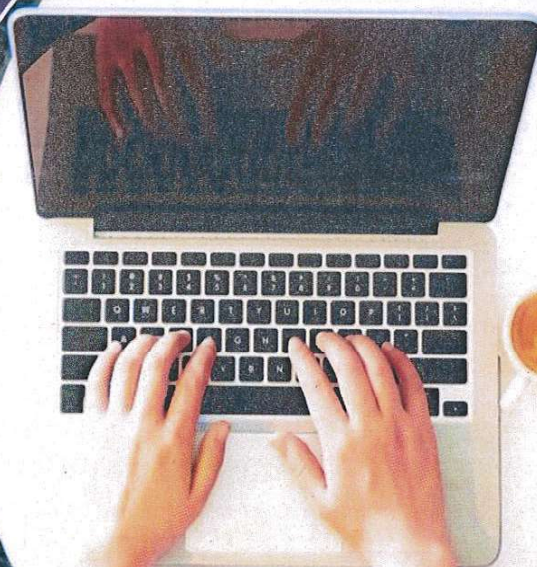
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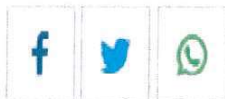
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Fundamentals of 3D Printing



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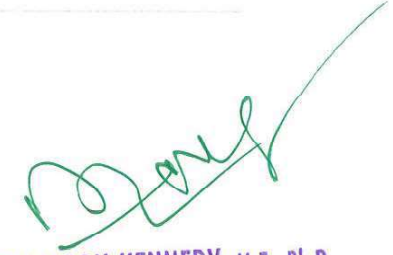
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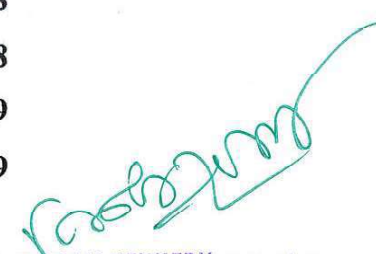
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Chapter 5

Fused Deposition Modelling of Polylactic Acid (PLA)– Based Polymer Composites: A Case Study

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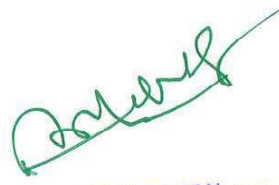
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ABSTRACT

In this chapter, a case study on polymer composites made using the fused deposition modelling (FDM) process is exemplified. The fundamentals of the additive manufacturing process, such as stages, applications, classifications, disposal methods, material selection, general principles of FDM, and selection process parameters, have been explained. The case study focuses on creating practical four-dimensional feedstock filament prototypes out of polylactic acid (PLA), polyvinyl chloride (PVC), wood powder,

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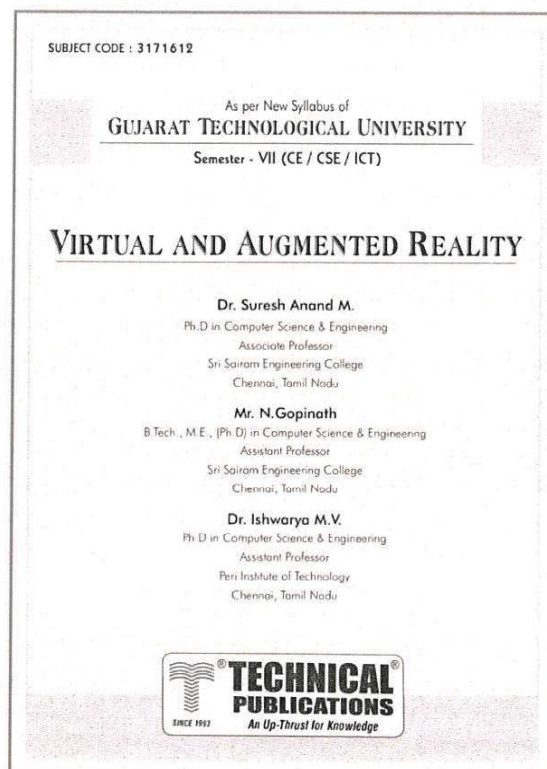
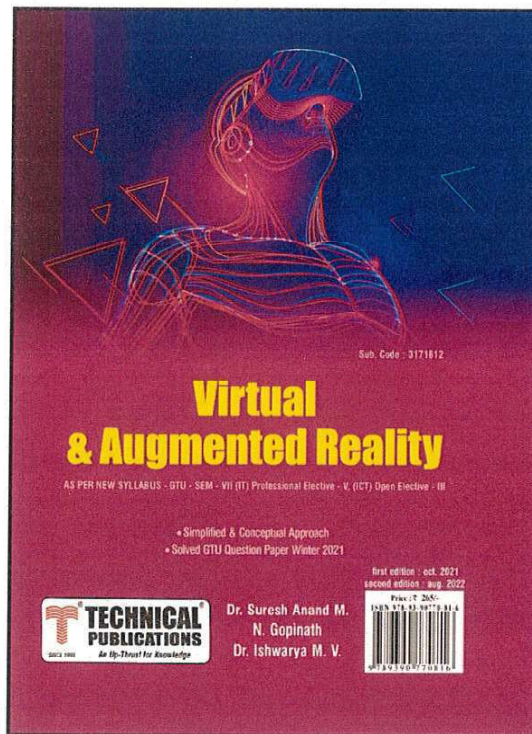


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Chapter - 1

Stability Analysis of Current Mode Controller for Ultra Lift Luo Converter using SMARTCTRL

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Chapter - 1

Stability Analysis of Current Mode Controller for Ultra Lift Luo Converter using SMARTCTRL

Dr. J. Raji, Dr. B.S. Nalina and Dr. M. Chilambarasan

Abstract

SMARTCTRL is a controller design tool used for power electronics applications. It is well known for its advantages such as user friendly interface, simple workflow and visual display of control loop stability and performance. Using SMARTCTRL, it is possible to design the controller for various power converters easily and quickly. In this paper, current mode controller is designed for ultra-lift Luo converter (ULC). ULC gives high voltage gain using voltage lift technique than all other Luo converters. The peak current mode (PCM) and average current mode (ACM) controller for ULC are designed using SMARTCTRL. The efficient controllers are designed using the values of the regulator components and the transfer function for specified phase margin in SMARTCTRL.

Keywords: SMARTCTRL, PSIM, average current mode, peak current mode, high voltage gain, voltage lift technique

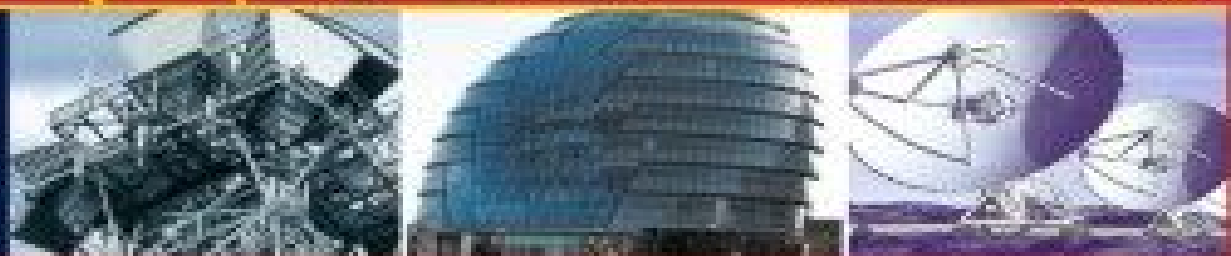
1. Introduction

Ultra lift Luo converter produces high output voltage which increases in geometric progression at each stage by using voltage lift technique. This technique improves circuit characteristics and gives high output voltage with small ripples. In this converter, a capacitor is charged to a certain voltage (may be source voltage) and the charged capacitor voltage is arranged in such a way to lift the voltage higher. For the regulation of the power converter, a controller is designed in such a way that the system remains stable irrespective of the input and load variations [1-3].

In this paper, PCM and ACM controller are designed for ULC. PCM controller has inner current loop and outer voltage loop. The function of the outer voltage loop is to control the output voltage directly and to supply the control voltage to the inner current loop. This controller has advantages such as improved line regulation, cycle by cycle current limiting, good transient

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