BIOGRAPHICAL SKETCH

At the bachelor program, I developed an expert system to characterize weld detects identified by ultrasonic nondestructive testing. Then, in Msc at Ferdowsi University of Mashhad, I worked on reliability assessment and sensitivity analysis of nondestructive testing. At Tennessee Tech University, I worked on metrology and additive manufacturing. My current thesis is about multi directional additive manufacturing.

EDUCATION

Master of Science — May 2018

Mechanical Engineering, Tennessee Tech University, Cookeville, Tennessee

Master of Science — Sep. 2015

Mechanical Engineering (Manufacturing and Production), Ferdowsi University of Mashhad, Mashhad, Iran

College of Engineering

TENNESSEE TECH

The Department of

Mechanical Engineering

Announces the Thesis Defense

of

Abolfazl Zolfaghari Abbasghaleh

In Partial Fulfillment of the Requirements

For the degree of

Master of Science

Thursday, April 5, 2018

Held in

Brown Hall 241 from 1.30—2:30 p.m.

FIELD OF STUDY

Mechanical Engineering

DISSERTATION TOPIC

Study on Multi Directional Additive Manufacturing

EXAMINING COMMITTEE

Dr. Yunbo Will Zhang (Major advisor)

Dr. Dr. Stephen Canfield (Co-advisor)

Dr. Kwun-Lon Ting (Mechanical Engineering)

ABSTRACT

Additive manufacturing as an advanced method of manufacturing is becoming more popular and applicable in wide range of industries such as medical and automotive for its advantages over traditional manufacturing processes. Among them, Fused Deposition Modeling (FDM) has gained more interests, which is based on fabrication of an object layer by layer. In typical FDM systems, height of each layer does not change normally during each layer formation using fixed bed. The mentioned systems have limitations in making complex shapes with higher accuracy. Also, they need supplementary support structures for overhanging parts of the product. To deal with the limitations, multi axis additive manufacturing systems have been proposed and used. One of the major challenges of the current multi-axis system facing is extremely higher price compared to regular additive manufacturing systems. For this reason, companies or individuals working on this area, are not interested to use them. In order to address this issue, a new multi axis system with considerably lower cost in comparison with the previous systems have been proposed and developed in this research. The system consists of delta type 3D printer, titling table, and controllers. Obtained results from the developed system prove its superior over traditional FDM 3D printing and its protentional to be used as a low cost multi axis additive manufacturing system.