



CARINTHIA UNIVERSITY OF APPLIED
SCIENCES

DEGREE PROGRAM: SYSTEMS DESIGN MASTER'S

LECTURE: DATA ACQUISITION AND
TRANSMISSION

FEASIBILITY REPORT

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Introduction

3D printers have taken over the world over the last decade and they have found use in industry, as well as in homes. The convenience of producing plastic parts at homes gathered attention of many hobbyists and makers. In industry, the ever-increasing production speed of 3D printers have made them suitable for rapid-prototyping, saving immense amount of time for product development and time-to-market. Civil engineers also found use cases for 3D printers: Mayorship of Istanbul has built its own 3D printed local service buildings within a week with a fraction of cost and build complexity.

In this feasibility study, the focus will be on an FDM printer's hotend temperature measurement with a thermistor.

Hotend temperature must be kept stable as fluctuations in hotend temperature would cause quality issues on the product, e.g. uneven surface finish and/or material deposition or nozzle clog. Therefore, the frequency at which the temperature is measured plays an important role.

Goals

The goal of this study is to analyze whether it is possible to sense the temperature 500 times per second, of the component in which the raw material would melt, without compromising component safety nor end-product quality, whilst remaining within the project budget. To reach these goals, requirements on the next page must be fulfilled.

Requirements

The following table describes the requirements:

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