**Development ofControl System for
Virtual Manufacturing System**

THESIS REPORT

**Proposed as one of the requirements to Obtain a Bachelor Degree in
Industrial Engineering**

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INTERNATIONAL PROGRAM

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Declaration Letter

I declare this research was conducted by myself except several citations that have been mentioned its sources.
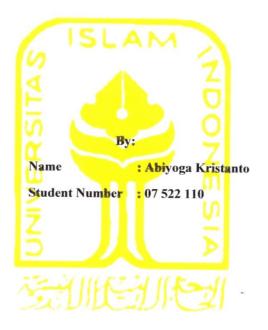
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Dedication Page

I dedicated this final project to my Dad,, my Mom,

my Sister and someone who loves me.You are my inspiration.

MOTTO

"O My Sons! Go you and enquire about Yusuf and his brother, and never give up

hope of Allah's Mercy. Certainly no one despairs of Allah's Mercy, except the

people who disbelieve"

(QS: Yusuf: 87)

Pat your own shoulder and says"it's not easy but I can do it, success is our right" –
Mario Teguh

"He gives wisdom to anyone He wishes, and anyone He gives wisdom to,

receives an abundant boon. Yet only prudent persons will reflect on it."

(QS: Al – Baqarah 269)

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Authors are aware there are still many shortcomings of this writing, the authors present a huge apology. Hopefully this report can be useful for writers and readers.

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Abiyoga Kristanto

ABSTRACT

Recently, Virtual Manufacturing (VM) has received great attention from several researchers because of its ability to save the time and cost. In VM, analysis of manufacturing activities are carried out virtually using computer technology so that it can be finished fast. Technically, all of objects in real manufacturing system are modelled virtually in 3D space. Besides, it is need to provide a control system as well in order to move and monitor the virtual objects in 3d environment. The aim of this research is to develop a control system for a VM system. The control system is developed based on inverse kinematic concept and it is instantiated using Microsoft Visual C# technology. A commercial 3D engine, TV3D system is also utilised in order to render the modelled 3D objects. Based on testing using a case study which involves 2 industrial robot arms with 6 degree of freedom, it shows that the developed control system is able to move and monitor the industrial robot arms without any collisions. It can be said fairly that the proposed control system is work well in such case study.

Keywords: Virtual Manufacture, Control Algorithm, Inverse Kinematic, TV3D

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