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Dipartimento di Ingegneria e Scienza dell'Informazione

Master in  
Computer Science

THESIS

# INTEGRATION VIA NETWORKS

*Integrating a third-party traffic software into a proprietary driving simulator*

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*Never trade luck for skill.*

— aviation humour



**Thanks**



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# PART I

## Preface



# Abstract



# Introduction



# PART II

## Motivation





# 1 Feasibility Analysis

## 1.1 Features

### 1.1.1 Software

### 1.1.2 Input Hardware

### 1.1.3 Output Hardware

## 1.2 Frameworks

## 1.3 Comparison

### 1.3.1 Attributes

### 1.3.2 Scoring

### 1.3.3 Analysis

## 1.4 Recap



# PART III

## Development



## 2 Software Descriptions

### 2.1 Madness Engine

### 2.2 VTD

### 2.3 0mq

### 2.4 Recap



# 3 Middleware Development

## 3.1 Concept

## 3.2 Structure

## 3.3 Networking

### 3.3.1 OS sockets

### 3.3.2 0mq

## 3.4 VTD implementation

## 3.5 Testing

## 3.6 Recap





## 4 Engine Integration

### 4.1 Approach

### 4.2 Modularization

### 4.3 Refinement

### 4.4 Limitations

### 4.5 Recap



# PART IV

## Analysis



# 5 Performance Analysis

5.1 Framerate

5.2 Network

5.3 Hardware

5.4 Bridge

5.5 Outcome

5.6 Recap



## 6 Code Analysis

### 6.1 Functionalities

### 6.2 Coding ease

### 6.3 Expandability

### 6.4 Recap





## 7 Further Work

### 7.1 Integration

### 7.2 Recap



PART V

Appendix



# 1 Math



## 2 Code





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