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**Towards Large-scale Humanoid Demonstration Data
Using VR Headsets**

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**Towards Large-scale Humanoid Demonstration Data
Using VR Headsets**

by

Steve Han

THESIS

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

MASTER OF SCIENCE IN COMPUTER SCIENCE

THE UNIVERSITY OF TEXAS AT AUSTIN

May 2023

Acknowledgments

Thanks to Mingyo Seo and Yuke Zhu for the project idea. Thanks to Mingyo Seo for creating the simulation, training the baselines, and adapting the whole body control code. Thanks to Kyutae Sim for helping with the data collection. Thanks to Carlos Isaac Gonzalez and Seung Hyeon Bang for help with the real robot experiments.

Towards Large-scale Humanoid Demonstration Data Using VR Headsets

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The University of Texas at Austin, 2023

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In our modern world that is designed by humans and for humans, the morphology of humanoid robots makes them the perfect platform for a wide range of applications. However, due to the complexity of humanoid robots and the shortage of demonstration data, research in robot learning for humanoids is scarce. In this thesis, I present a VR interface for collecting human demonstrations for humanoid robots in both simulation and reality. I propose that by embedding this data collection mechanism in VR video games, we can amass a large scale dataset of high quality human demonstrations that can drive the development of a future generation of autonomous humanoids. To illustrate the feasibility of this idea, I collect a small dataset on toy tasks in simulation and real robot using the interface. I then show that an imitation learning policy trained on the demonstrations can be deployed with a reasonable success rate.

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Chapter 1

Introduction

1.1 Background

In 1991 the `utdiss` package was written by Young U. Ryu in order to be used in the preamble of \LaTeX doctoral dissertation files at the University of Texas at Austin. Since then some changes have occurred, the most important one being the introduction of a new version of \LaTeX called $\text{\LaTeX} 2_{\epsilon}$.

In order to partially adapt the `utdiss` package to this new version of \LaTeX , Miguel Lerma introduced a few modifications in it, and his document, *How to Write a Doctoral Dissertation with \LaTeX* , served as a test for it. His new package was called `utdiss1`.

With the significant changes in style introduced by the Graduate School in the Spring of 2001, as well as my need to write a dissertation myself, I extended Miguel Lerma's package to meet these new requirements. As in Miguel Lerma's case, this document serves as a test for it, but it is, in addition, intended as a template for others to use in writing their own dissertations. The new package is called `utdiss2`.

1.2 Revised Philosophy for This Package

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Appendices

Appendix A

Lerma's Appendix

The source \LaTeX file for this document is no longer quoted in its entirety in the output document. A \LaTeX file can include its own source by using the command `\verbatiminput{\jobname}`.

Appendix B

My Appendix #2

B.1 The First Section

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B.2 The Second Section

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B.2.1 The First Subsection of the Second Section

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B.2.2 The Second Subsection of the Second Section

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B.2.2.1 The First Subsubsection of the Second Subsection of the Second Section

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B.2.2.2 The Second Subsubsection of the Second Subsection of the Second Section

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Appendix C

My Appendix #3

C.1 The First Section

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C.2 The Second Section

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