PROPOSAL:
HUMAN GUIDED ITERATIVE TRAINING OF DYNAMIC MOTOR SKILLS

A Thesis Proposal
Presented to
The Academic Faculty

by

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HUMAN GUIDED ITERATIVE TRAINING OF DYNAMIC MOTOR SKILLS

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SUMMARY

We propose a human-in-the-loop (HITL) system to develop dynamic controllers for virtual characters under the guidance of a human coach. The user only needs to provide a primitive initial controller and high-level, human-readable instructions as if coaching a human trainee. The virtual character interprets the provided instructions, accumulate the knowledge from the human coach, and iteratively improves its motor skills by optimizing control parameters. To facilitate the mapping between high-level instructions and control variables, we introduce a new representation of motor skills, the "motor tree" which hierarchically organizes the skills from the low-level motions to the complex ones. The hierarchical structure enables flexible re-assembly and efficient re-optimization by preserving the invariant features of motor skills. Further, the optimization process is accelerated by several techniques such as utilizing the failed previous trials or exploiting the idling time of optimizer. With the propose framework, the human coach can design complex dynamic controller for virtual characters intuitively and interactively.

CHAPTER I

INTRODUCTION

Every dissertation should have an introduction. You might not realize it, but the introduction should introduce the concepts, backgrouand, and goals of the dissertation.

1.1 Structure

haha

CHAPTER II

ITERATIVE CONTROLLER DESIGN

Resembles learning by demonstration,

2.1 *System Overview*

coaching and training

2.2 *Controller*

Our controller produces a torque

2.3 *Instruction*

our instruction are following:

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