CONCENTRATION
Epson Manipulator Card Sorting System

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Abstract—An implementation of an Epson robotic arm as a card sorting mechanism aimed towards mimicing human style situational problem solving regarding the game Concentration (A.K.A. Memory) with the intent on addressing methods to simplify decision making processes for the game Set. By first addressing a simpler problem we can assess the suitability of this system overall in performing complex sorting operations in a way that directly mimics the way a human would perform the task.

I. Introduction

The card game Concentration begins with a set of cards placed face down on a table. The player's objective is to pick up one card at a time and match it with another they have already seen before based on a specified criteria. This form of concentration is a building block to the game Set in that the similarity criteria can be modified and be made more complex. Something as simple as having the same card in every way to matching cards that share only some features.

The driving interest in this project was trying to exlore the similarities and differences between the series of processes and actions a human would take to complete a job and compare them with those that a robotic manipulator would need to undertake in order to match those actions. Since there is an inherently different way that machines work to humans we wanted to look into those differences and consider how best to make a system come as close to the original human playing style as possible.

Previous efforts from other research students around the world, on card sorting systems, seem to involve a robotic system that sorts cards it in a way that is specific to robots and lacks the capacity

I wish you the best of success.

mds

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II. Background

Background: Describe related work that has been published in the literature. What papers, books and other resources have you consulted and how does their work relate to yours? What outcomes and possible innovation are you hoping to achieve?

A. Program Control Paradigms

B. Vision Detection Principles

C. Motion

Degeneracy and Dexterity

- positions with multiple inverse kinematic solutions - can't select one, so stalls

III. Experimental Design

Experimental Setup or Design: Describe your experiment or the design of the system you are developing.

A. Program Control Paradigms

B. Vision Detection Principles

C. Motion

IV. Results

Results: Show the results you have achieved. Consider how you might present these results in a clear and concise manner. Although you will understand the significance of the results, make sure it is clear to the reader as well.

V. Discussion

Discussion: What are the implications of your results? What are the limitations of what you have done and how might the experiment/design be improved in the future?

VI. Conclusions and Future Work

Conclusions and Future Work: Discuss the implications of the results in a broader context, drawing conclusions and providing directions for future research in the area.

Acknowledgment

References

[1] H. Kopka and P. W. Daly, *A Guide to LaTeX*, 3rd ed. Harlow, England: Addison-Wesley, 1999.