

Practical-course Robotics (SS20)

Project proposal

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1 Objective

We want to have the robot play a game of connect four either with itself or maybe with human interaction. The robot will be able to grasp objects and place them on the connect four board. This behavior should be intelligent and account for fail-cases like misgrasping. Also the game strategy of the robot should be intelligent - implementing a simple connect four AI. We will include support for perception but are not sure how far we will take this part. The interaction with the human may take place by console input in the beginning and for the next step over webcam input. We will strive to have a expandable and modular design of our system, such that it can be understood and expanded.
 — still alot missing here - 0.5 page

2 Work Plan

one page – make this itemized

maybe add pic of scene with connect 4 model from project folder

Workpackages					
	State machine	16h	sT	1	
	Robot-internal states				
	State transition framework				
	Different behaviours in the framework				
	Framework	10h	T	1	
	Manage classes				
	Handle simulation/config space				
	Manage simulation steps				
	Interface to AI				
	Perception	5–20h depending on if perception will be fo			
J	–1				
	Detect connect 4 grid occupation				
	Detect objects (balls) on table				
	Needed: Position recognition				
	Optional: Orientation recognition				
	Optional: Object Identification/Tracking				
	AI	10h	TJs	minor 1, major –1	
	Bot vs Bot				
	Bot vs Human				
	Random				
	Optimal strategy				
	Human UI/UX	5–15h depending on if interaction implement			
J	–1				
	Develop user interface for selection of game mode				
	Console input of column				
	Webcam input				
	Build simulation world/g file	10h	sJ	0	

Make 3d connect 4 model (Different Shapes to put in)
Change Robot placement
Create objects (balls) statically/dynamically
Manipulation 30h sJT 1
Motion
Grasping
Dropping
Inserting object (ball/coin) into connect 4 grid
Collision Handling
Perturbation of balls/coins
Reachability of objects
Find threshold values