State Charts

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State Charts for T-RHex prototype

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for Team 1,

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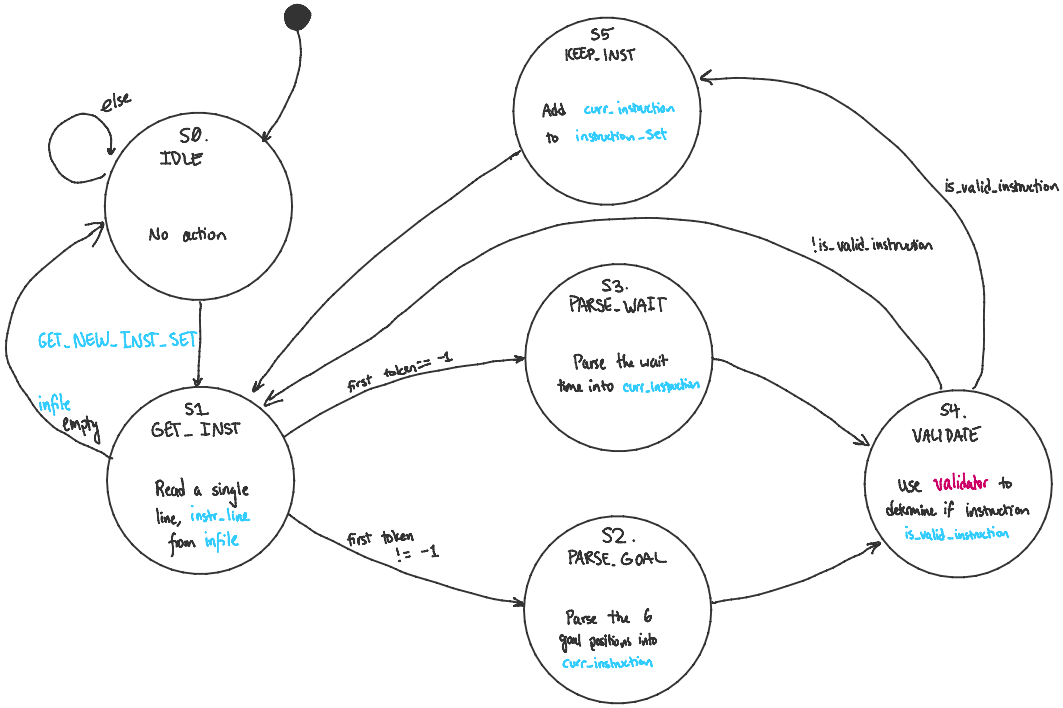
Instruction Parser



Signals:

Name	Scope	Type	Value Range	Description
infile	input	file	filepaths on disk	file that contains the instruction set formatted according to Appendix A, below
instr_line	internal	string	See Appendix A for format	A single line ready to be parsed into a new instruction
curr_instruction	internal	object	N/A	post-processed instruction
is_valid_instruction	input	bool	{true, false}	indicates whether curr_instruction is valid or not
instruction_set	output	list	N/A	List of instructions as a format the system can understand

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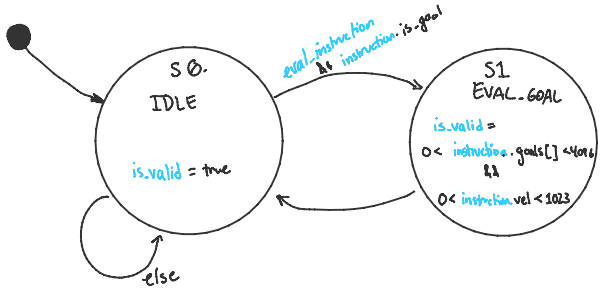
instruction_set	output	list	N/A	List of instructions as a format the system can understand
GET_NEW_INST_SET	input	bool	{true, false}	External command for whether we need a new instruction set
Validator	internal	Validator	N/A	reference to the system validator

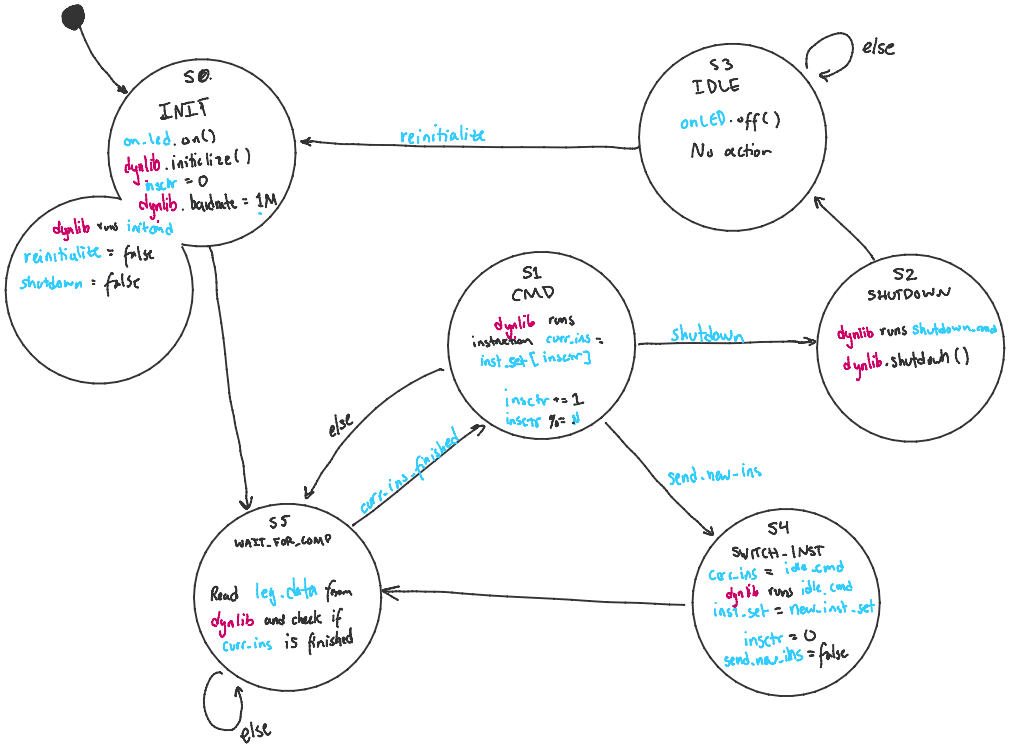
Validator



Signals

Name	Scope	Type	Value Range	Description
is_valid	output	bool	{true, false}	determination on whether an instruction is valid or not
instruction	input	Object	N/A	instruction to be validated
eval_instruction	input	bool	{true, false}	indicator to validate an instruction

Microcontroller

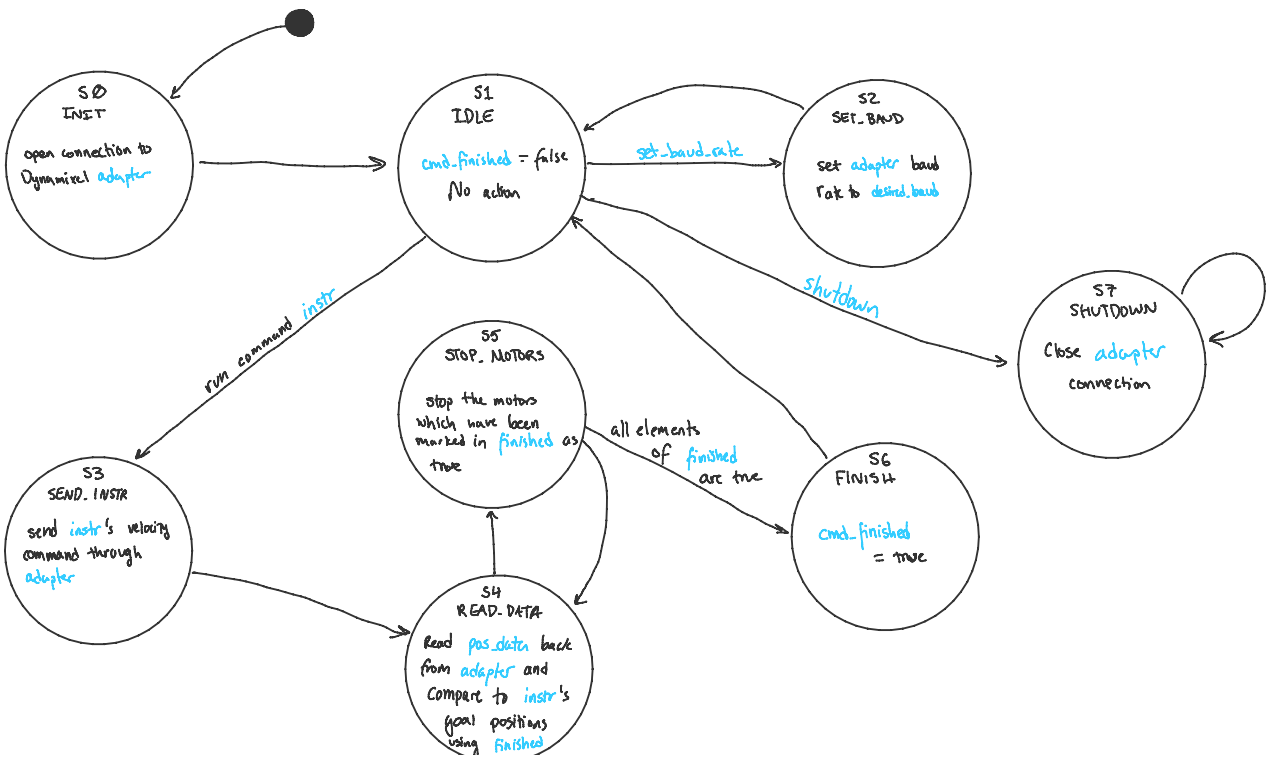


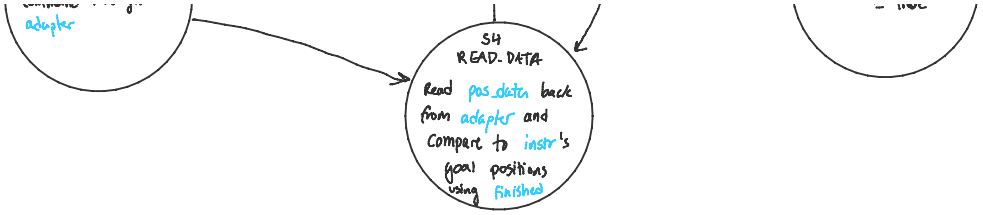
Signals

Signals

Name	Scope	Type	Value Range	Description
on_led	internal	LED controller	N/A	indicator LED for the system
dynlib	internal	Dynamixel_Interface	N/A	Dynamixel Interface reference.
instr	internal	int	[0, N)	index of current instruction the dynlib is executing
initcmd	internal	Instruction	all legs to -90	command executed on initialization
reinitialize	input	bool	{true, false}	input to reinitialize the robot
shutdown	input	bool	{true, false}	command to shutdown the robot
leg_data	output	uint16_t[6]	range (uint16_t)	array representing current positions of each leg
curr_ins	output	Instruction	N/A	instruction the dynlib is currently executing
curr_ins_finished	internal	bool	{true, false}	indicator whether the current instruction has finished executing.
inst_set	input	array<Instruction>	N/A	the set of instructions to execute
N	input	int	range (int)	the length of the instruction set
send_new_ins	input	bool	{true, false}	indicator that we want to change instruction sets
idle_cmd	internal	Instruction	all legs to -90	instruction for transitioning between instruction sets
new_inst_set	input	array<Instruction>	N/A	Replacement instruction set
shutdown_cmd	internal	Instruction	all legs to 90	instruction for when we've decided to shutdown the robot

Dynamixel Interface

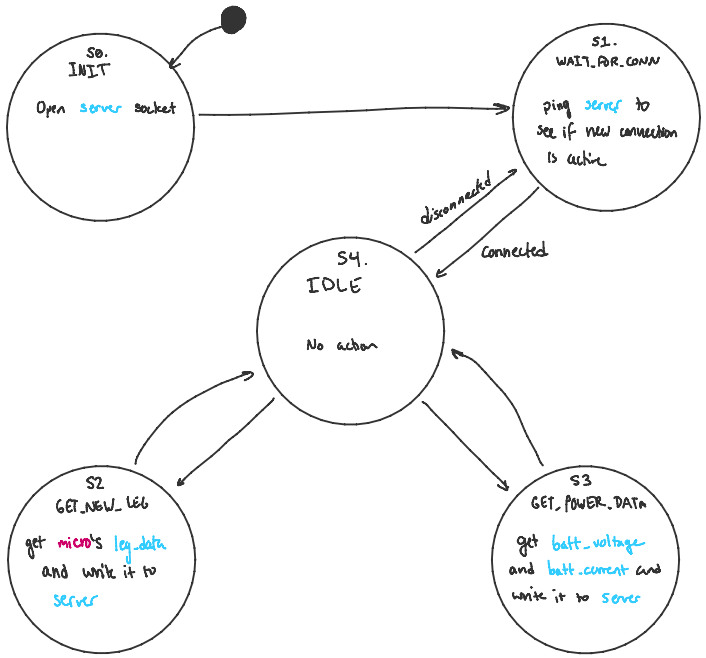




Signals

Name	Scope	Type	Value Range	Description
adapter	internal	Dynamixel::PacketHandler	N/A	the actual interface to the dynamixel servos
cmd_finished	output	bool	{true, false}	indicator of whether the current command has finished
set_baud_rate	input	bool	{true, false}	command to set the baud rate of the Dynamixel interface
desired_baud	input	uint32	range(uint32)	the desired baud rate for the system to communicate
instr	input	Instruction	N/A	instruction to run
pos_data	output	uint16[6]	range(uint16)	array for reporting leg position data
finished	output	bool[6]	{true, false}	indicators of whether a particular leg has reached its goal
shutdown	input	bool	{true, false}	command for shutting down the interface

Network Interface



Signals

Signals

Name	Scope	Type	Value Range	Description
Server	internal	socket	N/A	Socket for communicating with the visualization client
micro	internal	Microcontroller	N/A	Microcontroller instance for getting stats
leg_data	input	uint16_t[6]	ranged(uint16)	leg data obtained from the micro
batt_voltage	internal	uint32	range(uint32)	battery voltage in millivolts
batt_current	internal	uint32	range (uint32)	battery current draw in milliamps