Hot Pot Bot

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Product Pitch

Hot Pot Bot is a system that allows food to be cooked automatically while still maintaining the spirit of traditional hot pot, where friends and family sit around a table and drop raw ingredients including vegetables, tofu, and thinly sliced meat into a pot of boiling broth at the center, cooking and eating throughout the meal. With all the socialization and revelry going on, it's easy to overcook and lose ingredients that are floating around in the broth.

We required a contactless way to distinguish ingredients and a reliable way to cook them evenly. To achieve this, Hot Pot Bot controls three motorized strainers that move ingredients into and out of the broth, and it uses computer vision to identify and track ingredients as they are dropped into the strainers to determine the proper cook time. Our system classifies the contents of a strainer with 100% accuracy and cook time is consistent within 2 seconds.
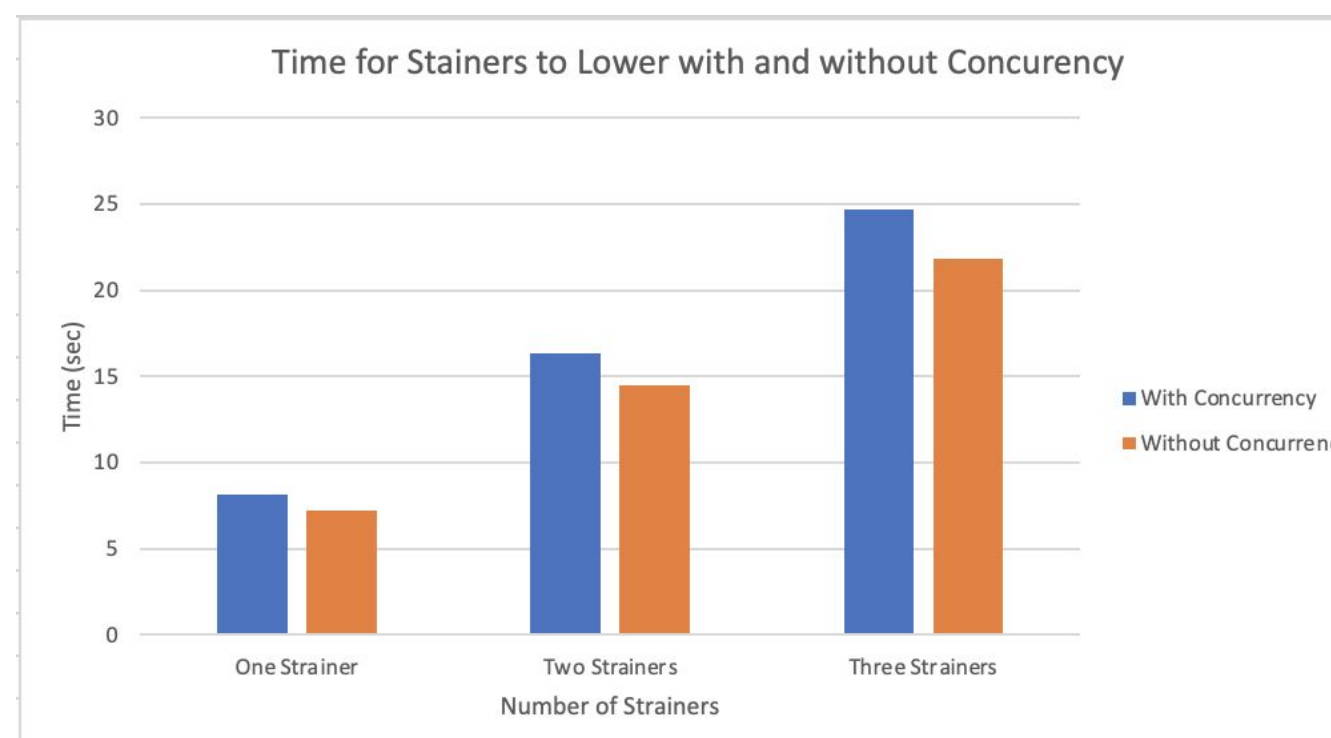
System Architecture

Overview Block Diagram

System Description

Overall System

Strainer Mechanism

Control Tower
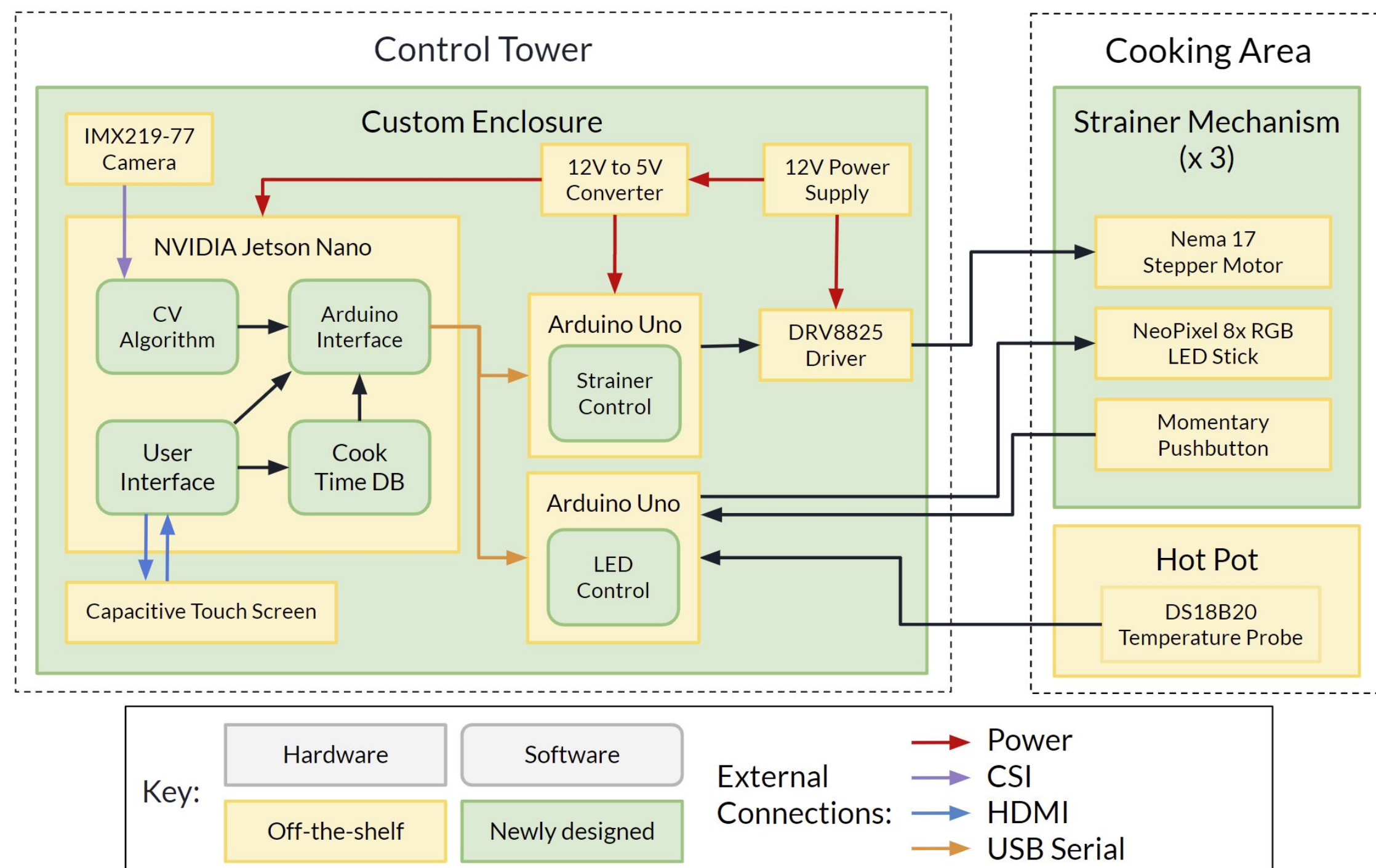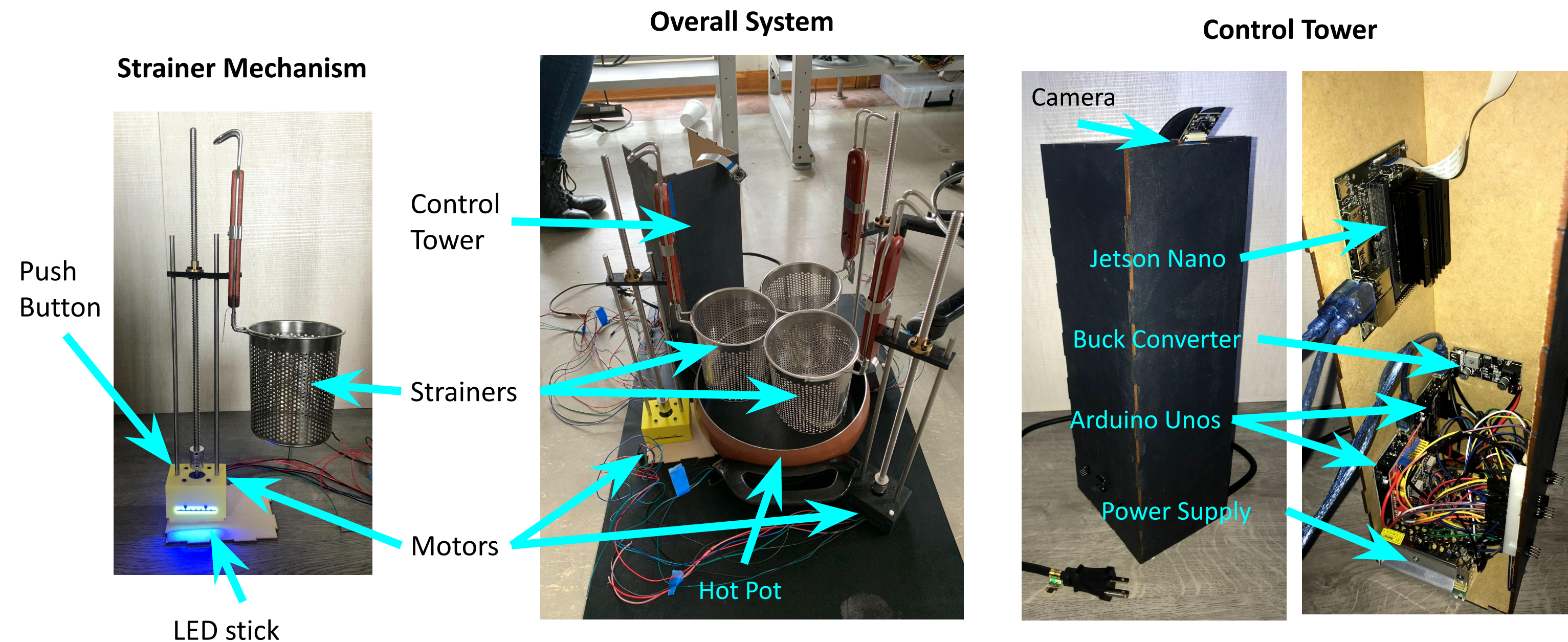
System Evaluation

Strainer Movement Tradeoff

Time for Stainers to Lower with and without Concurency

CV Frame with identified beef, bok choy, and mushroom

Confusion Matrix over a test set of 30 ingredients

ID / Actual	bok choy	beef	mush-room	fishball	tofu	not seen	individual accuracy	majority (strainer) correct?
bok choy	5						100%	Y
beef		4				1	80%	Y
mushroom			5				100%	Y
fishball				3		2	60%	Y
tofu			1		8	1	80%	Y, Y
overall							83.3%	100%

Test Metrics and Results

Feature	Success Metric	Result
CV accuracy	Overall strainer: >95%	100%
Strainer speed	Raise/lower in <5 sec	~7.1 sec
LED response	Change state <1 sec	~0.2 sec
UI response	React <1 sec	~0.1 sec