MICHIGAN STATE UNIVERSITY Project Plan Presentation SmartCook: Smart App for Induction Cooktop Cooking The Capstone Experience

Team Whirlpool

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From Students... ...to Professionals

Project Sponsor Overview



- Started as a small company in 1911 in Benton Harbor, MI
- Now a Fortune 500 company, with annual revenue of \$21 billion
- Delivers high quality home appliances to customers internationally
- Project will be to expand on the smart cooktop and improve overall customer experience with mobile app





Project Functional Specifications

- Automatically detect what pan is being used for cooking
- Detect when ingredient has been added to pan using sensors and temperature
- Dynamically adjust recipe for user, improving auto progression
- Seamless and intuitive integration with app to make cooking easier for user

Project Design Specifications

- Android and IOS app
- Target Audience: home/student chefs
- Scrolling Step Progression
- Guiding Visuals

Screen Mockup: Recipe Overviews



Screen Mockup: Setting Up Cooktop



Screen Mockup: Pairing a Cooktop



Screen Mockup: Scrolling Steps

	Béchamel Sauce	0°	
	STEPS	14 A 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	
1 Add	butter		
	-		50°F
			Preheating the pan to 200°F Next step will be shown automatically.
-			Whisk in flour
Add 2tbr	sp of unsaited butter to	the pan.	Incorporate milk
Ø Preh	eat the pan	1000	Cool and whisk
Whis	sk in flour		Add salt and nutmeg
Incor	rporate milk	1. A.	
Cool	l and whisk	March 190	Mark State
Add	salt and nutmeg		• • 8

Screen Mockup: Preheating



Screen Mockup: Timers

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	Béchamel Sauce	0 °
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Whisk in	flour	
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11		C-
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	2.00	
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Add <mark>2 tbsp.</mark> whisking con are well com	s +1m - all-purpose flour Istantly, until butte bined and foaming	and cook, r and flour
Add 2 tbsp. whisking con	s +1m - all-purpose flour Istantly, until butte bined and foaming color.	and cook, r and flour



Screen Mockup: Step Progression

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	pt Béchan	nei Sauce		0
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milk, wi pale and	ilsking const I smooth. I and whisk salt and nu	antly, until		is o

and a	1 Ale	X			
	6:00)	6:00		
1	+30s +1m	+5m			
until saud trall when	to cook, whisk ce is thickened i n you run your v y and the foami	it should lei vhisk throug	ave a gh it)		
G Add	salt and nutme	9			
	_				
	Next				

Screen Mockup: Turning Off Cooktop



Project Technical Specifications

- Assist Cooking with Temperature (ACT) project
- Two main tasks:
 - Pan Registration and Recognition:

 Using sensors on surface of ACT only
 Use data and ML to classify
 Need pre-cooking routine for recognition

 Recipe Automatic Progression:

 Detect when ingredient added to pan
 Each have a different effect on sensor reading



Project System Components

- Hardware Platforms
 - ACT Layout:
 - o 2 Temperature Sensors
 - Components Measure Inductance
 - CCB2 Serial to USB Adapter
- Software Platforms / Technologies
 - Flutter for cross-platform app development
 - Scikit-learn for machine learning
 - PyCLC to log data from cooktop
 - WebSocket to connect backend to frontend
 - Recipe database server with MongoDB



Project System Architecture



Project Risks

ML Model may not account for all scenarios

- Misplacement of pan or different types of pans
- Consider edge cases and develop a procedure for testing

Getting PyCLC to connect with app through WebSocket

- Need to add WebSocket functionality
- Use router to create closed system for communication
- Possible that model cannot capture all ingredients
 - Small quantities? Liquids vs solids? With ingredients already in pan?
 - Optimize model to balance speed vs accuracy
- Getting untested libraries to function together
 - Explore alternative options if needed

Questions?



Team Whirlpool Project Plan Presentation