Project Plan Presentation

SmartCook: Smart App for Induction Cooktop Cooking

The Capstone Experience

Team Whirlpool

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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
Béchamel is one of the building blocks of French cuisine. A precise medium-low temperature will give you a smooth sauce every single time.

**INGREDIENTS**

- Unsalted butter: 2 tbsp
- All-purpose flour: 2 tbsp
- Whole milk: 1 ¼ cups
- Salt: ⅛ tsp
- Ground nutmeg: 1 tsp

Portions: 1

**INGREDIENTS**

- Unsalted butter: 4 tbsp
- All-purpose flour: 4 tbsp
- Whole milk: 2 ½ cups
- Salt: 1 ½ tsp
- Ground nutmeg: 2 tsp

Portions: 2
Screen Mockup: Setting Up Cooktop
Screen Mockup: Pairing a Cooktop
Screen Mockup: Scrolling Steps

1. Add butter
2. Preheat the pan
3. Whisk in flour
4. Incorporate milk
5. Cool and whisk
6. Add salt and nutmeg

Add 2 tbsp of unsalted butter to the pan.

Preheating the pan to 200°F...
Next step will be shown automatically.

- Whisk in flour
- Incorporate milk
- Cool and whisk
- Add salt and nutmeg
Screen Mockup: Preheating

1. Add butter
2. Preheat the pan

Preheating the pan to 200°F...
Next step will be shown automatically.

3. Whisk in flour
4. Incorporate milk
5. Cool and whisk
6. Add nutmeg

250°F
Screen Mockup: Timers
Screen Mockup: Step Progression
Screen Mockup: Turning Off Cooktop
Project Technical Specifications

• Assist Cooking with Temperature (ACT) project

• Two main tasks:
  ▪ Pan Registration and Recognition:
    o Using sensors on surface of ACT only
    o Use data and ML to classify
    o Need pre-cooking routine for recognition
  ▪ Recipe Automatic Progression:
    o Detect when ingredient added to pan
    o Each have a different effect on sensor reading
Project System Components

• Hardware Platforms
  ▪ ACT Layout:
    - 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

Stovetop

MongoDB

Dev Environment

Flutter

App

User

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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