MICHIGAN STATE UNIVERSITY

Project Plan Presentation

SmartCook:

Smart App for Induction Cooktop Cooking

The Capstone Experience

Team Whirlpool

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Spring 2023

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

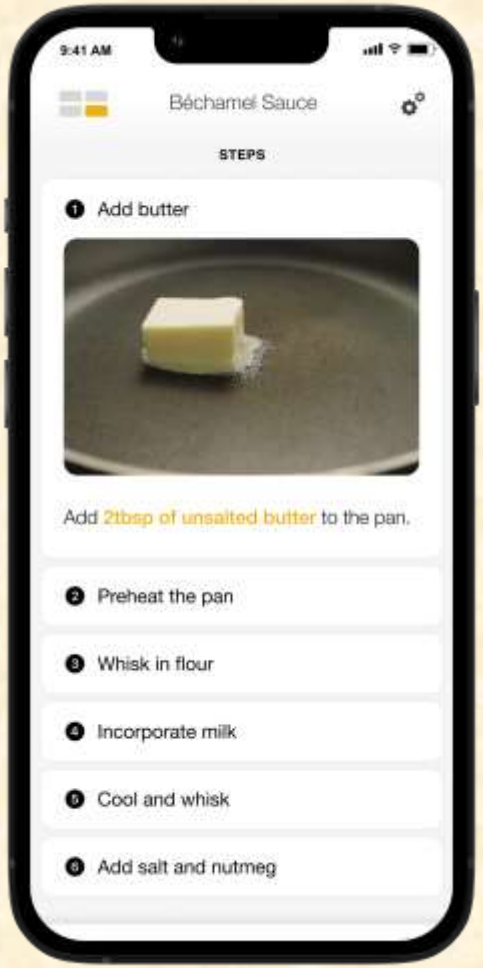
- Android and IOS app
- Target Audience: home/student chefs
- Scrolling Step Progression
- Guiding Visuals

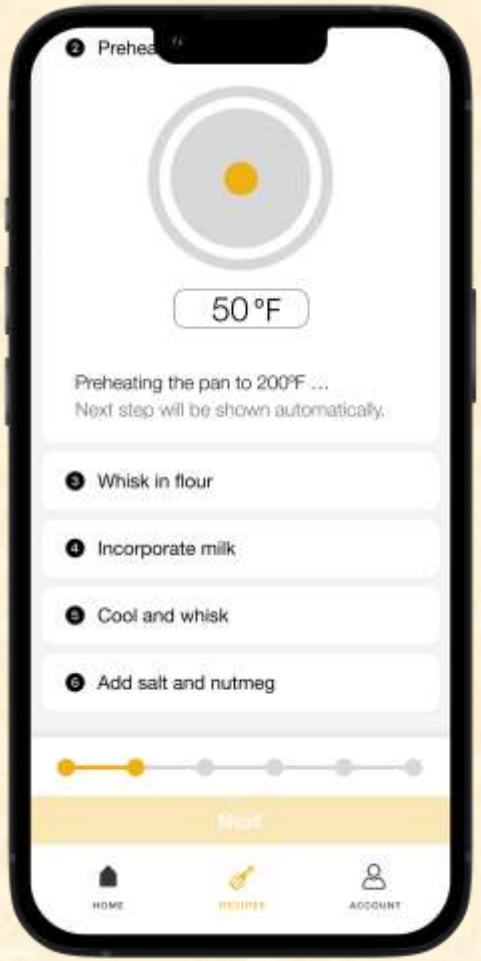
Screen Mockup: Recipe Overviews

Screen Mockup: Setting Up Cooktop

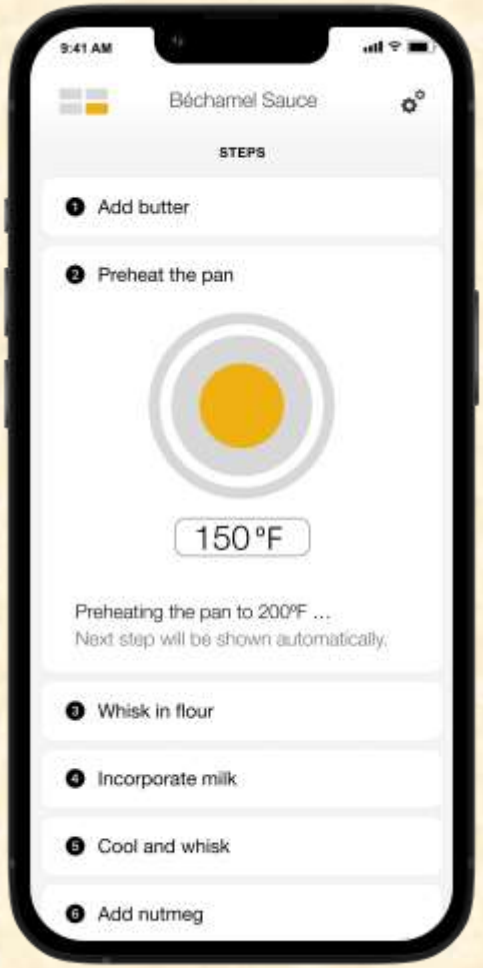
Screen Mockup: Pairing a Cooktop

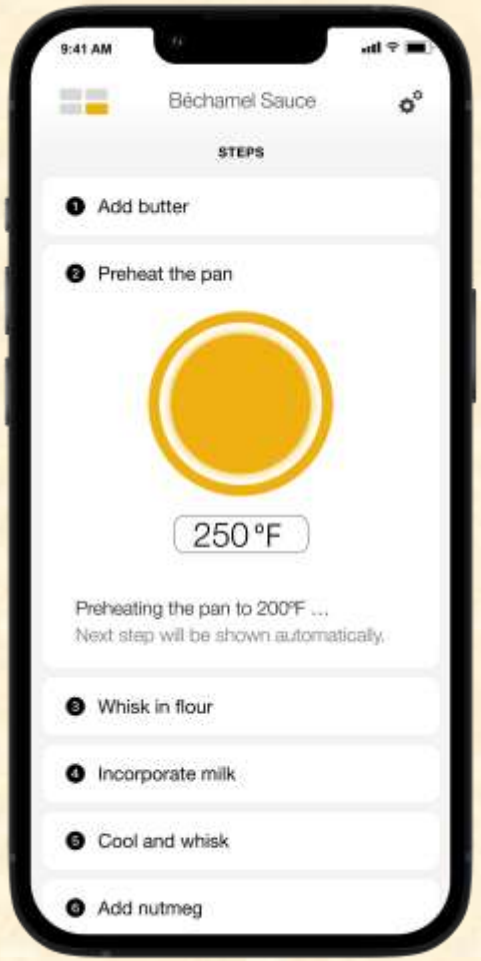
Screen Mockup: Scrolling Steps



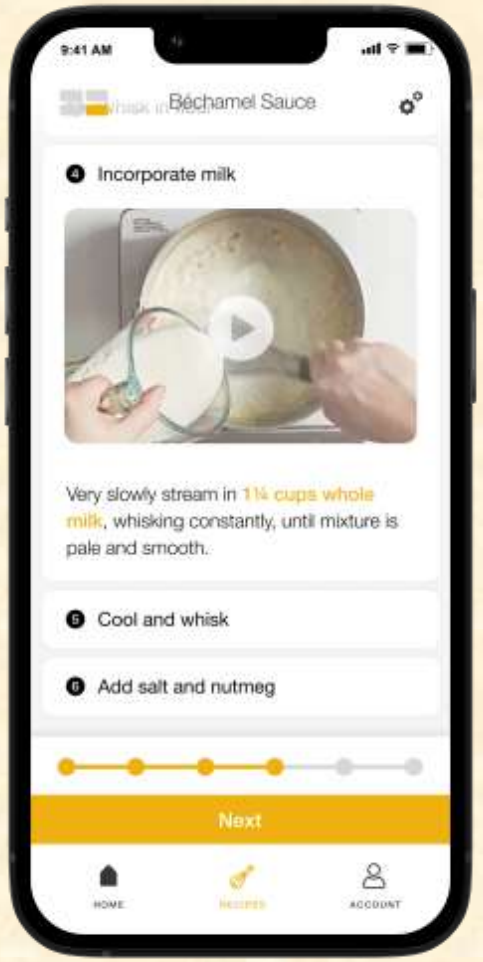


Screen Mockup: Preheating

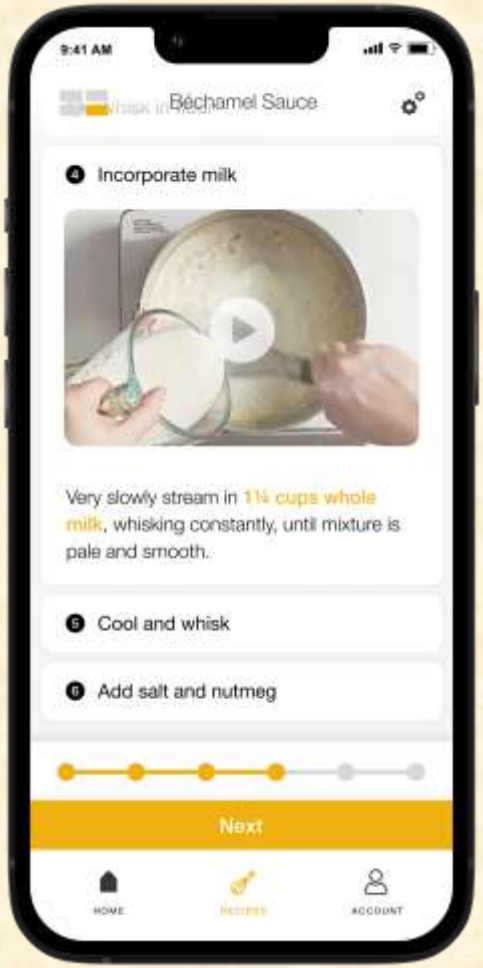


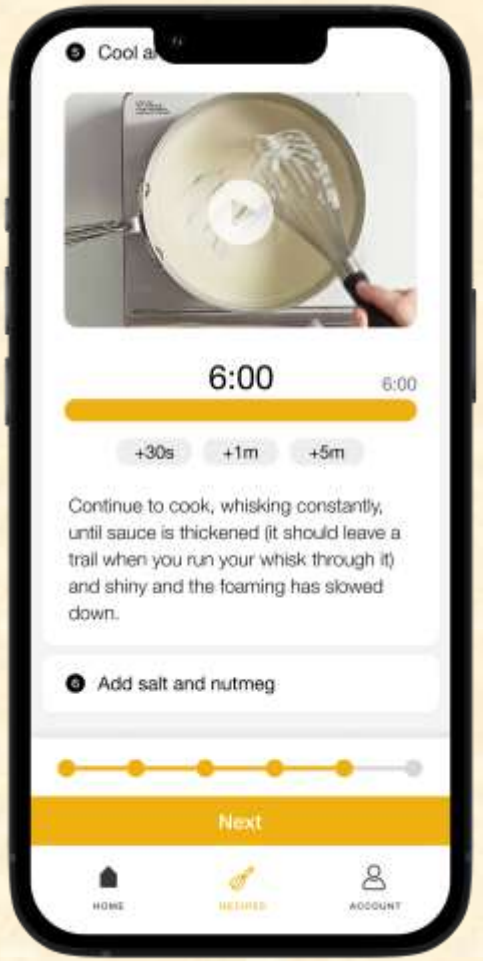


Screen Mockup: Timers

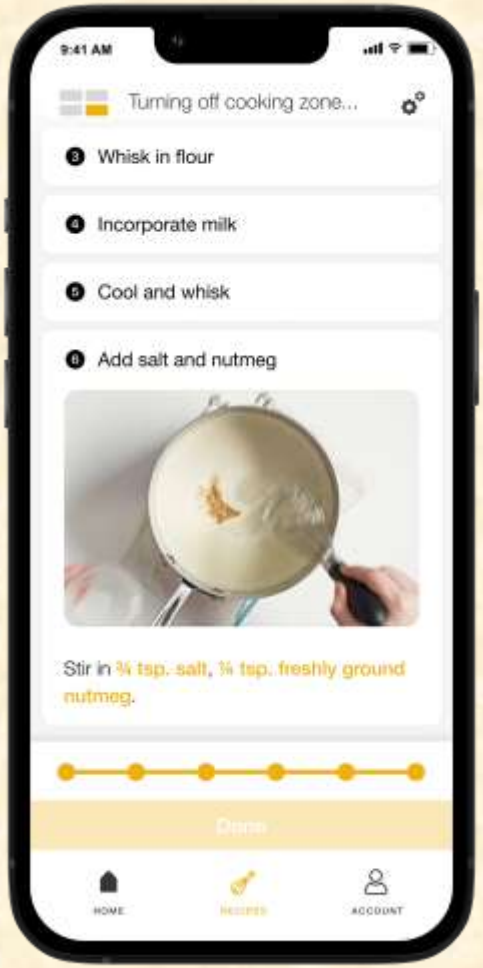


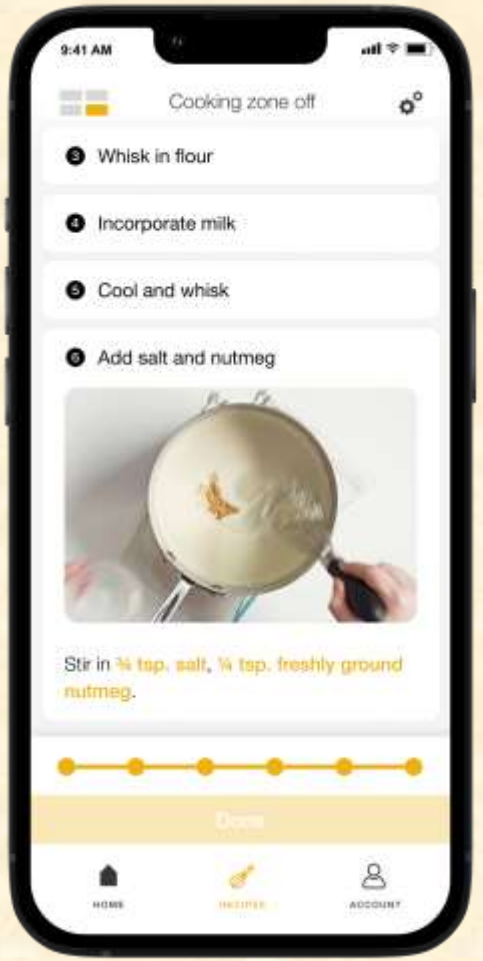
Screen Mockup: Step Progression





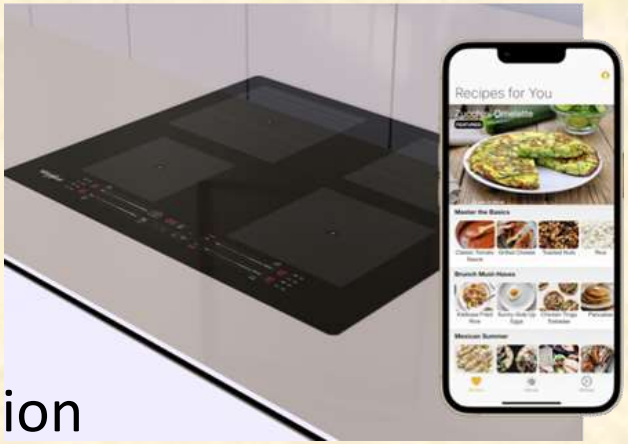
Screen Mockup: Turning Off Cooktop





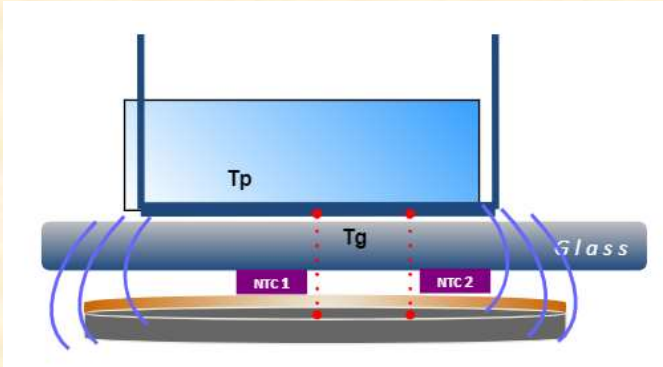
Project Technical Specifications

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



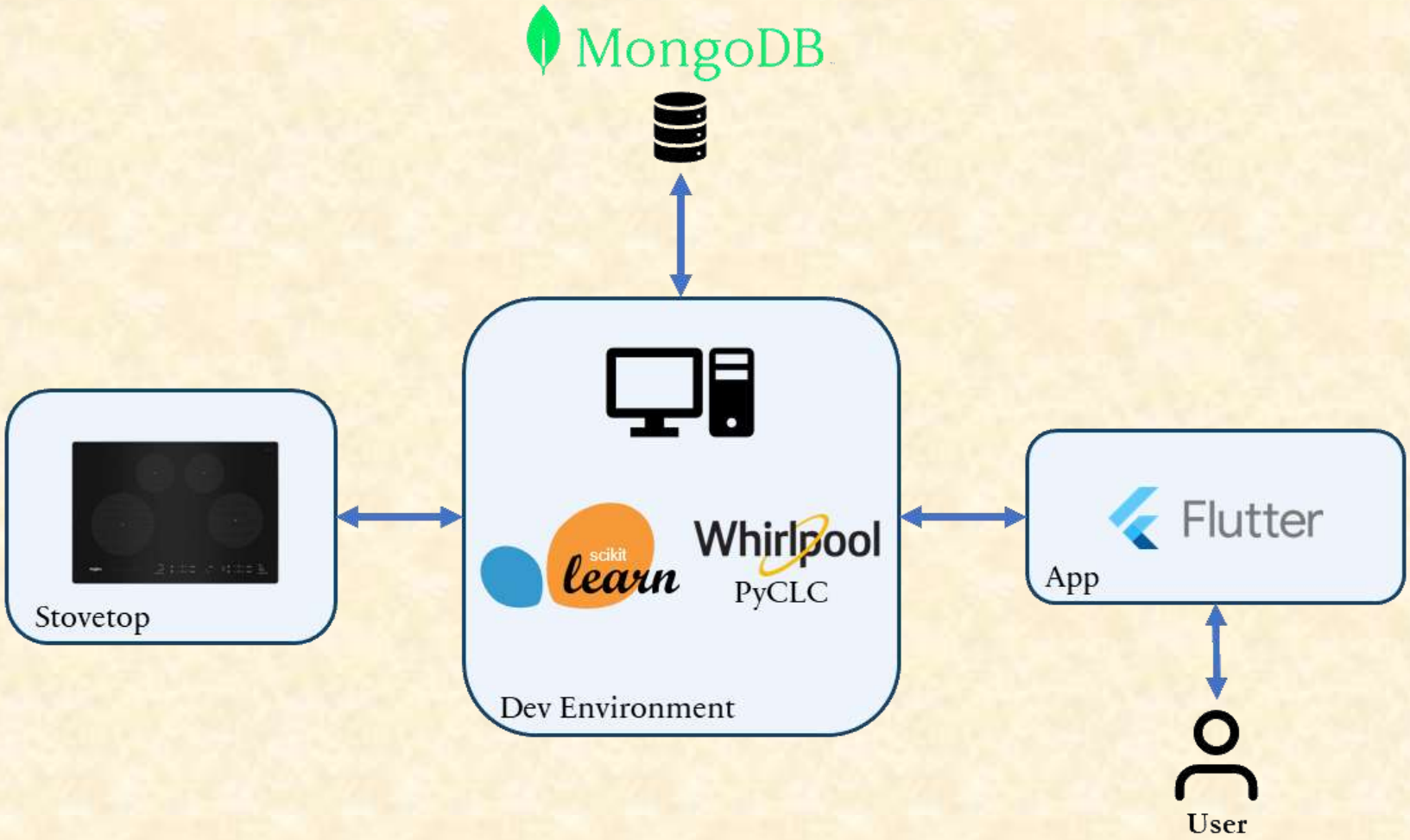
Project System Components

- Hardware Platforms
  - ACT Layout:
    - 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?