Product Requirements Document
Chefing

Team 4

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Summary

An augmented reality cooking app that guides users through step-by-step instructions in Magic Leap. We believe this application can provide users with an intuitive and enjoyable culinary experience.

Project Description

Cooking is supposed to be a fun process. However, many people struggle with constantly switching between stovetops and digital recipes when learning to cook something new. The hassle can be inconvenient and unsanitary. An Augmented Reality display is a perfect solution to this dilemma as users can refer to a recipe while keeping the food tractable at the same time. Previous projects in AR cooking are concepts of showing a 2D screen of recipe and instructions overlayed on top of the 3D environment, but none of them has fully taken advantage of ML's support on spatial mapping and image tracking. The 2D interfaces are not as entertaining to interact with either. Also, some of them do have good user interaction but are hardcoded and only works in a specific scene. With Magic Leap, we believe we can create an application that users can easily use in their kitchen without complicated setup, and that provides consistent information on time and location of food. We are also planning on creating human-centered UI and delightful animation to make the cooking experience interactive and amusing.

User Experience

Describe:
- Setup: map your kitchen, register cooking utensils
- How do people start the app: choosing a recipe, decide portion
- what happens in the beginning:
- what is the next step

- What's the task for user to do
- how does it end
- How do people finish successfully
- Extra activity if people are interested

Hardware Platform/Device

List your device and software platform and how you're going to use it to benefit your app. What apps, what capabilities. Do you need additional sensors, devices, ..? Talk about all of that. Be detailed.

Deliverables

Describe the features of your product in 3 phases:

- **Minimum Viable Product**: A minimum viable product (MVP) is a product with just enough features for a worthwhile and successful launch. You've removed all the non-essential "nice to have" features.
  - Setup
    - Select a menu
    - Register cooking applications

  - Following one recipe
    - Cookie -> baking amount of time reasonable?
    - Tacos
    - *Breakfast burrito*

  - First recipe: breakfast burrito
    - **Ingredients:** (8 servings)
      - 3 tablespoons vegetable oil
      - 4 cups (12 oz) frozen shredded hash brown potatoes (from 30-oz bag)
      - 8 eggs
      - ½ teaspoon salt
      - ½ teaspoon pepper
      - 6 fully cooked breakfast sausage links, cut in 1/4-inch pieces
      - 1 package flour tortillas for burritos (8 tortillas)
      - 2 cups shredded Mexican cheese blend (8 oz)

    - **Utensils:** pan, spatula, measuring cup, teaspoon, knife, cutting board, medium bowl, large bowl, foil
    - **Steps:**
      1. In a skille/pant, heat 2 tablespoons of the oil over medium-high heat.
      2. Add frozen hash brown potatoes in even layer; press down lightly. Cook potatoes 7 minutes without moving. Drizzle with remaining 1 tablespoon oil; turn. Cook 6 to 8 minutes longer or until browned on both sides and hot throughout. Transfer to medium bowl; cover with foil to keep warm. Wipe out skillet.
      3. In a large bowl, beat eggs, salt and pepper until well blended.

4. In same skillet over medium-high heat, cook sausage 2 to 3 minutes, stirring frequently, until browned. Stir in egg mixture; cook 2 to 3 minutes, stirring occasionally, until scrambled.
5. To assemble burritos, a spoon line of hash browns down the center of each tortilla. Top with cheese and egg mixture.
6. Roll up each tortilla tightly to secure filling. Serve immediately, or freeze.
7. Voila!

- Features
    - Hand instructions. Different gestures for proceeding to the next instruction
    - Dashboard that has an interface for instructions.
        - Users can put the dashboard anywhere
        - Instructions show up on dashboard
        - Replay instruction button
        - Next, previous instruction
    - Arrow pointer of utensils, events(steps)
        - For example, where is the next step going to occur
    - A backend data-structure that controls flow, enabling replay and progress
    - Timer and alarm for steps that need one

- **Target Product**: What are you committing to ship/demo in the end of the class. (you will be graded based on achieving these)
    - A cooking application where user can pick the available recipe and step by step goes through the cooking instructions.
    - Animated instructions.
    - Users can interact with the instructions using their hands, fingers.

- **Stretch Goals**: If you finish early, what extra features do you want to pursue?
    - Object Tracking, or move tags along with physical objects that they describe using hand tracking
    - A recipe processor that can generate processes from a recipe automatically instead of hardcoding one. Our first recipe will be arranged by ourselves.
    - Content persistence, making the ability for
    - Social media integration

Performance Metrics

How will you evaluate if your product is operating as intended? E.g., Functionality, Performance, User Experience, Accuracy, Realism, Stability, Effectiveness. For each of the Milestones below we will grade based on this performance metric on scale of 0-1 with 1 meaning perfectly achieved and 0 not done, .7 means looks good but missing some features.

Describe here

- Functionality: Will the application have all the intended features. Does each feature work as described in the MVP.
- Effectiveness giving instruction.
- User Experience: How user friendly is the application? Is it easy to use?

Milestones

Week 1-2 should have things you've been working on until now.
Each week starting week 3 should have:
- 1 line milestone description
- And a detailed list of responsibilities for **each** named team member
- Plan for a **Minimum Viable Product (MVP)** by the end of week 5. We will have MVP presentations from each team during week 6.

Week 1
Week 2
Week 3
- Key Milestone for this week: PRD Done and work on MVP begins, Website done, pitch to the class.
  - Start to figure out about object tracking
- Details: catch up with blogpost and update our website. Everyone should start researching and designing.
- Evaluation Metric: our website and blog posts should all be up-to-date. Each member have a concrete idea of how they approach their own tasks and start implementing next week.
- What each member is doing
  - Xiao: designing backend, test mock up interface
  - Travis: Blog Post, Room mapping
  - Tim: Integrating hand tracking.
  - Yuansi:Designing 3D interface/dashboard, ideate 3D models and animation
Week 4
- Key Milestone for this week: a mock version of our MVP.
- Details: a naive application that can integrate animation, workflow, and controls. The key point is to make sure all elements are successfully integrated, not the quality of each of them. Test on headsets or simulators.
- What each member is doing:
  - Xiao: finish a system that does sequential workflow. It should contain functions such as time, check points. Naive control mapping that allows us to test previous & next steps

- ○ Travis: Finished room mapping, and set up a basic interface for user.
- ○ Tim: Making animations and instructions interactable.
- ○ Yuansi:

Week 5 (MVP Done)
- Key Milestone for this week: Achieve MVP
- Details: make our application as close to MVP as possible. Clean up redundancy, review designs, and fix bugs.
- What each member is doing:
  - ○ Xiao: Implement functions allow users to skip steps. review and modularize the backend to be expandable. Look into how to "deserialize" recipes into application state for future use.
  - ○ Travis:
  - ○ Tim:
  - ○ Yuansi:

Week 6
- Key Milestone for this week: object tracking, recipe generator.
- Details: Try to use object tracking to obtain location information. Implement a process generator which we feed it with a recipe in a special format, it can generate an application process. This is essential for creating more recipes.
- What each member is doing:
  - ○ Xiao: Finish the generator.
  - ○ Travis:
  - ○ Tim:
  - ○ Yuansi:

Week 7
- Key Milestone for this week: Parallel steps, persistence, object tracking
- Details: Allow users to make their own choice on steps that are parallelizable. Implement persistence (if only found possible), for users to resume a previous incomplete session. This can help us adapt more recipes
- What each member is doing:
  - ○ Xiao: implement parallel steps
  - ○ Travis:
  - ○ Tim:
  - ○ Yuansi:

Week 8
- Key Milestone for this week: voice control and social media integration
- Details: incorporate voice control in our application. Enable recording through device and sharing on social media platforms.
- What each member is doing:
  - ○ Xiao:
  - ○ Travis:
  - ○ Tim:
  - ○ Yuansi:

Week 9
- ● Key Milestone for this week:
- ● Details:
- ● What each member is doing:
  - ○ Xiao:
  - ○ Travis:
  - ○ Tim:
  - ○ Yuansi:

Week 10
- ● Key Milestone for this week:
- ● Details:
- ● What each member is doing:
  - ○ Xiao:
  - ○ Travis:
  - ○ Tim:
  - ○ Yuansi:

Final Demo Day
- ● Key Milestone for this week:
- ● Details:
- ● What each member is doing:
  - ○ Xiao:
  - ○ Travis:
  - ○ Tim:
  - ○ Yuansi:

Materials and any external help needed

3D Assets - https://courses.cs.washington.edu/courses/cse481v/20sp/links.php
Paid Software
Scanning
Hardware
Outside Expertise
…

Budget

List all items that you will need to purchase, for example, 3D assets, software, or hardware. Try to be as specific as possible (if you have already identified specific items, please include links to assets, online store pages, amazon links etc.).

Once we approve your budget (typically < $500, but exceptions are possible), you will be able to make purchases without further approval.

If you are not sure what exactly you will need yet, providing an estimate is OK. Teams can change the budget section during the quarter but increasing your budget will require further approval.

Purchasing website (to be modified to this class soon): https://sites.google.com/cs.washington.edu/vrpurchasing/home

Risks and how they will be addressed

Describe at least three major risks to your plan. For each one, categorize it as low, medium, or high, and describe mitigations -- if Plan A doesn't work, we will execute Plan B, etc.