

# Technology in the Kitchen: How Gestural Input Might Influence the Cooking/Dining Experience

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# 1. Choosing an Application Area

In our first meeting, we listed possible application areas, first at random and then that were of particular interest to us. We then brainstormed a little on each of the application areas, which mainly revolved around how we/other people perform activities related to these areas. What are the common problems/challenges faced? Which areas stood out to us in particular need of solutions that hadn't particularly been explored yet?

## 1.1 Brainstorming application areas

Possible Locations/Areas of Interest

(Note that the asterisk \* indicates someone endorsing the idea as a favorite as explained below)

- Education/Classrooms \*
- Running - beginners to varsity
- Advertising in White Plaza, getting people's attention
- Beginning PE class \*\*
- Playing music - turning pages
- Hand rules in physics
- Cooking \*\*\*
- Dance
- Singing \*
- Drawing
- Beverage dispensing
- Ordering in restaurants and cafes
- Learning to write new languages/inputting in computer
- Painting
- Presentations \*

## 1.2 Narrowing down our top choices

As a next step we marked a star against 2 of the areas we liked the most. We noted the winner (via our star method as described above and from the d.school handout) as cooking, the clear favorite having been the only idea to

receive 3 stars. This left us with the opportunity to move forward immediately instead of debating which topic had the most merit. We decided to observe various cooking scenes (personal kitchen, house kitchen, dining hall, restaurant) in detail and to interview people regularly involved in food preparation and consumption. We also decided to explore some additional areas of interest such as tennis practice, social dance etc. to keep opportunities open for interesting observations and design opportunities. We narrowed down following areas for observations :

- 1) Waiting in Line
- 2) Social Dance
- 3) Advertising
- 4) Cooking / Food Preparation

## *2. Observations and Interviews*

### *2.1 Waiting in Line for placing order :*

Place : Thai Cafe, A Restaurant on Stanford Campus



*Observations :*

- 1) Many people standing in line
- 2) Line is growing continuously.
- 2) The person standing right ahead of me is getting frustrated, he needs to hurry for class.
- 3) People coming and leaving seeing the long queue.
- 4) Only payment method - cash - wastage of time while returning cash!

2.2 Social Dance :

Place : Stanford Roble Gym (Class Dance#47)



*Observations:*

- 1) Couples practicing swing dance form after class
- 2) A couple is having difficulty getting their steps and postures right

- 3) There is a mirror on one of the walls, but looking in the mirror isn't helping them much
- 4) They are trying to ask the instructor but he seems busy with other students

## 2.3 Advertising

Place : Tressider White Plaza

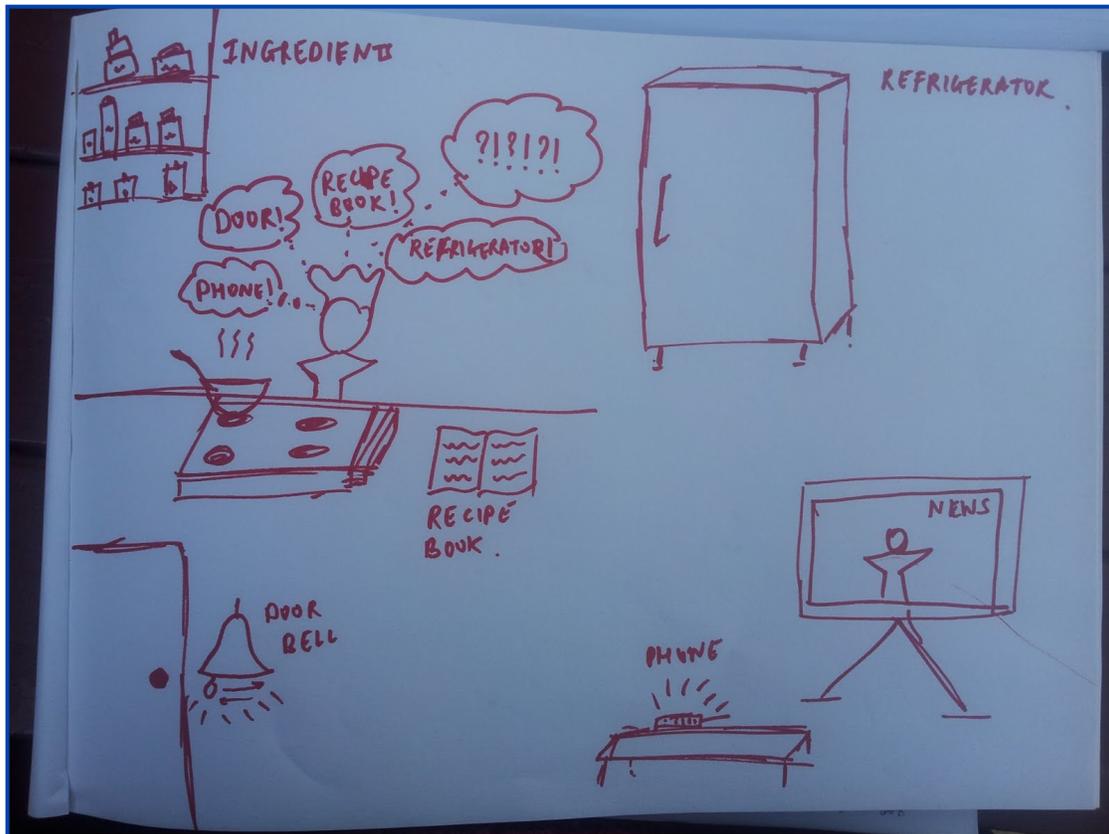


### *Observations :*

- 1) 2 people are trying to stop students passing by.
- 2) Students aren't stopping, they are rushing to classes.
- 3) On closer observation - they are trying to advertise for Sierra - An environment Club
- 4) A girl finally stops to listen.
- 5) She is being walked through lot of forms.
- 6) She waits for few seconds and leaves.

## 2.4 Cooking /Food Preparation :

### 2.4.1 Home Cooks in Rains



#### *Cooking Observations (Kitchen - Rains Houses) :*

- 1) Jenni is cooking a new italian recipe
- 2) She is not sure of the exact ingredients and the quantity.
- 3) She is using measuring cups again and again to get the proportions right.
- 4) She is also using a recipe book.
- 5) Her hands are dirty, she is having trouble turning recipe book's pages.
- 6) Her cell phone rings, she is stuck with those hands again.



### *Cooking Observations (different kitchen in Rains Houses):*

- 1) Friend is cooking a recipe on a borrowed iPad
- 2) She is balancing some ingredients in front of the microwave but they're in the way since she is using the microwave too
- 3) Other friends are trying to help
- 4) She is following a recipe for the main dish and improvising some side veggies
- 5) She is using a strainer as a steamer and a mismatched lid

### **2.4.2 Storey Kitchen Observations**

#### *Observations of Craig - Storey Chef*

- 1) Listens to music while cooking
- 2) When someone enters the kitchen he is very social and will start talking to you while he's cooking

- 3) Makes full use of his body to accomplish certain tasks. For example, he uses his foot to close the low oven
- 4) He has to bend down to open low ovens
- 5) Keeps his food list away from his workspace
- 6) Not the cleanest of workspaces. Has a “hasher” who helps him in the kitchen
- 7) When he sees someone, he likes to call out their name to initiate conversation
- 8) His motions, especially during food preparation, are very practiced. They are generally large and consistent
- 9) When talking to other people, he can't really make eye contact because he focuses on what he is doing; keeps his eye on the food as much as possible
- 10) Has to walk back and forth a great deal in the kitchen. For instance, the sink, refrigerator, stove, and food storage cupboards are all located several steps away from one another, so he spends a lot of time walking up and down
- 11) “Batch cooking”, that is, making a large amount of something for multiple dishes. Eg. cooked a pot of vegetables to use for all the meats and the tofu he prepared



### *Craigs Comments*

- It's sometimes annoying having to walk back and forth to parts of the kitchen. It takes like 20 steps to get to the sink and back
- I have to walk too far to get stuff, and I'm on this hard floor all day

- Cooking is too scientific. You have to make exact measurements
- These low hanging pots: I hit my head on them sometimes. The last chef that used this kitchen was very short so she did not have a problem when doing food prep, but when I bend down and go back up I have to watch my head
- You have to adapt to a kitchen that's not built for you
- The way I cook is "batch cooking". So I made this pot of vegetables and I'm gonna use it for the chicken, the beef and the tofu.

*Interview with Tim Dang - Storey Kitchen Manager*



1) How much time do you give yourself when cooking something?

**Tim:** Depends on how much time I have and depends on dish, so I'd choose the dish based on how much time I have. E.g. when I'm cooking house meals, if I only have an hour then I'll make something that takes an hour, but if I had five hours then I'd make something where I could make full use of that time.

2) What is your favorite dish(es) to make?

**Tim:** Don't really have a favorite dish, but I do have favorite techniques: braising and pan-roasting

3) What sort of kitchen environment/workspace do you prefer?

**Tim:** Cleanest. I use the principle of 'clean while you cook'. As soon as I'm finished with something I clean it or pack it back.

4) Where do you keep the ingredients that you need?

**Tim:** There is a French phrase which I follow, "mise en place", which means everything in its place. Before I start cooking, I must have cooked the entire dish twice in my head. That way when I actually begin cooking the dish it's just a matter of putting everything together. Everything must be laid out and ready.

5) Which part of cooking do you like best?

**Tim:** Food-prep. For me it is the calm part of the day, it is chill, there is no rush. The cooking itself is the opposite because it is time-sensitive.

6) Are there any parts of cooking that you don't like?

**Tim:** Having to be on someone else's schedule. For example if you are finished a task and the only thing you can do for the next half an hour is just stand around and wait.

7) Do you like a quiet kitchen or a more noisy one?

**Tim:** I like having music playing, but not to the point where I must raise my voice. At the end of the day, the kitchen is a place of work.

8) What do you find most rewarding about cooking?

**Tim:** Personally, knowing you can do things. Personal satisfaction. It is nice to feel appreciated when you cook something for someone else, and at that point it is no longer about the food and more about the person/people involved. If someone cooks something for me, for instance, it becomes less

about the food and more about the person; I know very well the time and effort that had to be put in.

9) What do you find most challenging about cooking?

**Tim:** Getting people to realize what it takes to do certain things. As Kitchen Manager, my job is to sort of bridge the gap between the kitchen and food on the table, but not everyone realizes how much time and effort certain things take. Sometimes ingredients are obtained from other regions and countries and take several days to get delivered, sometimes making a dish takes three days, all for the purpose of having food for the house. It's difficult to get other people to see the big picture.

### **2.4.3 Dining Hall Observations**

Place: Stern Dining Hall

#### *Observations in Line*

- 1) people queue up into obscenely long lines for food
- 2) hard to see what's being served in front of long line, people on toes trying to see, walking around others to the front to see
- 3) people get into long line without knowing what's being served and ask what's everyone here waiting for while waiting for it
- 4) lots of people standing there saying nothing and staring
- 5) lots of people on their phones or chatting with a friend they're with
- 6) some people eating other food they've already grabbed while waiting in line



### *General Observations in Hall*

- 1) much more crowded earlier than later, starts to Peter out towards end
- 2) food spillage, scattered all over counter have to constantly clean
- 3) no way to tell if condiments have run out, people stand there and squeeze machine trying to get lat bits and drops out

### *Workers/Cooks*



- 1) store replacement food in large silver heaters/fridges
- 2) only replace food when they see it's out with their eyes
- 3) it can take up to 10 minutes for a dish to get refilled if it goes unnoticed
- 4) mid 20s to 30s
- 5) have tins of pre-made food they heat up or burger patties squished into right shape so all they need to do is slap it on the grill

## 3. Ideation

First we put our key observations down on post-it notes to throw out all of our insights before we could narrow our focus.

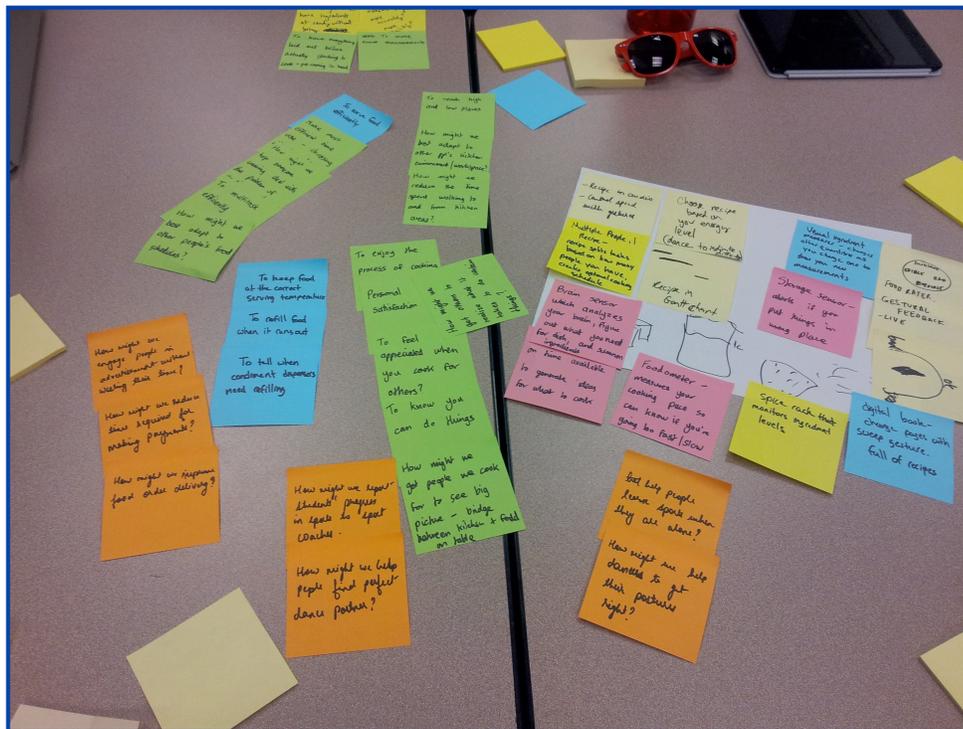
### 3.1 Synthesizing needs

We then used verbs to describe various needs that were suggested based on the observations and interviews. We wrote each need on post-it notes.

Needs were clustered around the following themes:

- increasing efficiency and saving time
- getting personal satisfaction from external validation
- accurately measuring cooking ingredients
- having the proper ingredients at a convenient distance without being in the way
- knowing if your form is correct (whether in tennis or elsewhere)

### 3.2 Synthesizing design ideas



Based on these need themes focused around cooking and food preparation we came up with the following design ideas:

- Recipe in audio where you control speed with gestures (think a Garmin for cooking)
- Recipe split into different tasks for 1 to many people and creates optimal cooking schedule (think Gantt chart)
- Foodometer that measures your cooking pace so you can know if you're going fast or slow
- Choosing a recipe based on your energy level (dance to indicate desired recipe difficulty)
- Visual ingredient measurer that enables you to scale up or down the recipe with gestures and it shows you the new measurements visually
- Storage sensor that alerts you if you put things in the wrong place
- Food rater (gives live feedback) that you control with gestures (maybe like a dial?)
- Click button based on time available to generate ideas for you to cook
- Brain sensor that analyzes your brain and the ingredients you need for the recipe you're imagining

## 4. Bodystorming

### Outline:

Narrator: will talk about the problems that users were facing, talk about observations, insights, and then present the design solution and talk about it briefly (30 to 45 seconds)

**Scene 1:** 1 person cooking; props - laptop, recipe book, apron, cell phone  
present things going wrong

- person puts wrong ratios of ingredients
- finds it difficult to read from recipe book/turn pages and cook simultaneously
- does not know whether or not people have liked the dish in the past

**Scene 2:** introduce the gesture based app - 1 person cooking

- person uses the recipe reader from the app to avoid hassles with the recipe book - show gestures to increase decrease audio speed
- person also uses change proportions feature to smartly compute ingredients proportions when one of them is varied
- other guys taste the food - act that it is good
- feedback feature - gesture either thumbs up or down or hand movement (problem how to tell what is good/bad)

### Script

Props needed: cutting knife, regular table knife, cookbook, two chairs (from class), two screens, empty bottle (for oil), pot, table (class), an arrow or stick

### *Intro*

**Narrator:** We observed many people cooking in the kitchen. Some of the things we observed were that people often have difficulty determining the right ratios of ingredients when the quantity of a recipe changes, have trouble turning the pages of a recipe book without making a grand mess on it, having

to walk up and down constantly to get from one area of the kitchen to another ... \_\_\_\_ How can we solve these problems and help people who cook satisfy their needs? How might we enhance the entire process and experience? Well, here's how it used to look:

**Scene 1** - Chef, two eaters, props person

(Cook enters the kitchen and begins to do his thing, carrying a recipe book - makes recipe, whatever)

**Cook:** (To himself) Okay, so I usually put 2 cups of oil in this, and then I chop up 1 pound of green peppers and onions. But, I'm making a recipe for 26 people instead of 11. Hmm... that must leave me with, AH, I know! 6 cups of oil, 1.5 pounds of veggies. Of course!

(Cook then begins to put oil in pot.)

**Cook:** Hmm, maybe I'll knead the dough for the bread in the meantime while that pot's getting hot.

(Goes and kneads the dough)

**Cook:** All right, I think it's vegetable time. Let's see what the directions say. I'll just skip going to the sink to wash hands... it's so far away. Ridiculous.

(Tries to turn the page of the recipe book, but his hands are all messy from the dough. No avail. Then tries turning it with his elbow. No luck either. Ends up using a clean kitchen knife to turn the page).

**Props person:** Ring, ring, ring!

(Chef fumbles to get his cell phone. Has to put down clean knife and recipe book, grabs a napkin and wraps it around his hand, then reaches into his pocket to get the phone out. Places it between his shoulder and head and starts chopping the veggies simultaneously while talking)

**Chef:** Yes, it's going well. Thank you. I'll talk to you later.

(Accidentally hangs up using his hand which still has dough on it.  
FRUSTRATION!)

**Chef:** Arrrg, stupid phone, stupid dough, whatever. Let's get this chicken in the pot!

(Puts chicken in, cooks it)

**Chef:** Wait...how come they're so little veggies? What's wrong with this recipe?? Hmm, I guess they'll just have to deal with it. Sorry veggie-lovers. Alright, showtime! (brings food out)  
(Some people look at food, originally with excitement, and then smiles fade of their faces.)

**Person 1:** Oh no, not again! I don't even like this dish! Shouldn't the chef know it's not that great?

**Person 2:** You could just rate his dish online.

**Person 1:** Yea, but that's a waste of time. And it's annoying. And I can't just go into his kitchen while he's cooking and tell him, "Oh hey, I liked that spaghetti and meatballs that you made the other day," or, "You know, I'm not the biggest fan of your chicken stir fry. The kitchen is a place of work and a lot of chefs like their privacy.

(Chef, and 2 people simultaneously sigh)

**Narrator:** With cooking, it's hard to satisfy everyone's needs. Chefs need to make good food, use the right measurements, feel a personal sense of accomplishment and be able to cater to many people. People need to enjoy their eating experience, which means having tasty food, and need to have their feedback heard in a personal way. That's why after that day Chef Mahalia tried this cool new gesture based interface system: FoodNav. Here's how things look now!

*Scene 2* - Chef, two eaters, props person

**Chef:** (In the same way as Scene 1) Okay, so I usually put 2 cups of oil in this, and then I chop up 1 pound of green peppers and.... you know what? Maybe I should cook a different dish.

(Uses hands to flip through screen pages and looks at each of his dishes, taking note of it's rating).

**Props person:** (Animates pages flipping, with sounds effects)

**Chef:** Hmm, bbq pork? Na, not that popular. Pasta? Eh, mildly popular. (Keeps flipping) Aha! Grilled tilapia! I think I'm gonna make this dish for 28 people instead of 12. (Raises his hand to increase recipe size, lowers it to decrease)  
**Props person:** (Animates the numbers changing and the amount of each ingredient increasing/decreasing, with sound effects)

**Chef:** Oh look! The amount of each ingredient changes too! This is great! Now for sure I won't make an underestimation like last time. Let's get this seasoning for the tilapia on a roll!

(Chef starts doing food prep, vigorously and excitedly, getting his hands dirty)

**Props person:** Ring, ring, ring!

**Chef:** (Looks at screen) Hmm, "grab and pull towards ear to answer". (Does a grabbing motion, bringing imaginary "phone" towards his ear)  
Yes, oh why hello there! (Continues to cook while carrying on conversation)  
Yes, I'm using this really cool gestural based kitchen interface. Okay, bye bye. (Pulls the "phone" away from his ear and closes it to hang up) Alright, seasonings ready, time to season up this fish and cook it! (Seasons the fish)  
Yes! Perfect ratios! (Cooks the fish) Showtime, here we go!

(Chef brings food out. People look eagerly, in anticipation, smiles get wider and faces get more excited as they realize it's a dish that they love)

**Happy person 1:** Oh yay! I love grilled tilapia! I'm gonna let the chef know before I even start eating! (goes over to food rating screen and turns his arm

towards the positive side. Chef sees the like bar increase on HIS screen in the kitchen)

**Chef:** Oh this is great! More feedback!

**Happy Person 2:** (after finishing his meal) Wow, I really enjoyed that! But I'd still like to rate down his curried tofu; I wasn't the biggest fan. (goes up to food rating screen, flips through the "pages" until he finds the curried tofu page, then turns his arm towards the negative side to rate down.)

### *Ending*

**Narrator:** With FoodNav, you can be guaranteed that both chefs and consumers satisfy their physical, mental and personal needs. Both you and your chefs will be more happy than ever. Keep on cooking, and keep on eating.