



157 Church Street, 19<sup>th</sup> floor  
New Haven CT 06510  
USA

## Distracted Driving Game – Brainstorm Report

Client: University of Michigan  
Author: Maya Goedert  
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## **Introduction**

This document was written after a brainstorm session conducted by the PreviewLabs team together with the University of Michigan.

This document consists of five concepts out of 19 ideas that resulted from the brainstorm session.

Based on this document, three concepts are recommended, which will then be described in a prototype design document (PDD). Those concepts will be developed into a prototype.

The first iteration of these prototypes will focus on gameplay and implementing slow and fast thinking tasks. All 3D artwork will be kept as simple as possible, allowing to focus on the functionality of the concept. The themes described in this document can change depending on the outcome of the first iteration prototypes. Gameplay mechanics from one concept could be applied within another theme. After a first iteration, the best concept will be developed further.

All of the concepts will show how a player scores with only fast thinking tasks and how their attention and score changes when slow thinking tasks are introduced.

In order to select the best concepts, the following criteria were applied:

- The score needs to be shown very clearly before vs after introducing the second task (with optionally a score being shown for the second task as well). This will allow showing that the first score is impacted by the second task.
  - Consequence: Two tasks should probably not contribute to the same goal so it's very clear that the second tasks reduces your score (and does definitely not increase it).
- Is the player being forced to do the second task or are they allowed to not do the second task at all? Ideally, the player is motivated/tempted to do the second task, and it doesn't attribute to the same goal as the first task.

Based on these criteria, PreviewLabs recommends to start with a first iteration of *Distracted Navigator*, *Distracted Sorter* and *Distracted Cook*. PreviewLabs sees this as the most promising concepts in terms of gameplay elements and fast vs slow thinking tasks.

## **Requirements**

The five game concepts all consist of a combination of fast thinking tasks and slow thinking tasks. This to show players what happens when you're distracted while driving.

The slow thinking task should impair the fast thinking task and a noticeable and measurable decrease in the fast thinking task should occur when the slow thinking task is introduced.

While playing these games, at least one of the following three types of distractions will be introduced:

- Shared model of attention (simultaneous cognitive demands): doing two things at the same time.
- Switching model of attention (switching between tasks): e.g. alternating focus on texting vs on driving (performance of driving tasks goes down periodically)
- Inattention blindness (obliviousness to certain things such as a stop light): as an effect of slow thinking

All requirements are listed in *2018\_11\_12\_distractedDrivingRequirementsSession.pdf*. These requirements have been taken into account when generating ideas during the brainstorm session.

## **Concept 1: Distracted Navigator**

### **Summary**

This concept was envisioned as the player being an astronaut in a spaceship. The player must navigate the spaceship back to earth, but along the way he faces some challenges.

### **Description**

In this prototype the player will have to steer the ship towards earth by looking at a control screen. Every now and then the direction might have to be slightly adjusted to assure staying on the plotted course towards earth.

Along the way different challenges are encountered. The player must continue to look at the control screen, but at random times an AI voice will inform the player of an issue and how to fix it. The player must fix this issue quickly and divert his attention back to the control screen. While the player looks away from the control screen, the spaceship will drift away from the plotted course. Challenges become more complex as the game progresses. Some ideas for challenges

- Alien critters have invaded the control panel. Similar to whack-a-mole style gameplay, the player must hit all the critters that appear on the control panel quickly before they disappear again.
- One of the ship's ion thrusters is malfunctioning and needs to be rebooted. The AI assistant guides the player through a sequence of buttons that need to be pressed and levers to be pulled. The player has to find and press these buttons or pull the correct levers in time to fix the thruster.
- A repair bot goes through an identity crisis and starts disassembling parts of the ship. The player has to pick up complex shaped pieces and place them back where they belong, similar to a puzzle. The pieces must be attached again by placing them in the correct spot and then hammering them in place.
- The ships plants are dying which causes a lack of oxygen. Whenever the AI gives the player the instruction to water a plant, the player must turn left or right, find the dying plant and water it.
- The last escape pod on the spaceship has been launched due to a system malfunction. As it drifts away in space, the AI instructs the player to retrieve the pod. This must be done by typing in the coordinates on a num pad. The AI will read the numbers out loud, and the player has to enter them correctly.

The spaceship environment is clean and minimal: a screen is visible in front of the player and the control panel extends to the sides of the player. If an issue doesn't get fixed immediately or becomes an urgent situation, an alarm starts blaring.

## Concept 2: Cheese Bandits

### Summary

In this concept the player is a mouse that has snuck into a home to steal cheese. Different types of cheese have to be sorted and placed in corresponding baskets (cheddar in the cheddar basket, etc.).

### Description

The game is played on the table in a room. The environment is actual scale, so all objects will be large compared to the player's scale. The player sees the counter, a plate with a cheese cube in front of him, and baskets to the side. The homeowner enters the room every now and then, at that point the player must stand still to avoid getting caught.

When looking down at their body, they'll see their hands shown as white gloves.

- The player has to grab a cheese cube from the plate and sort it into corresponding baskets. The cheeses can have labels or different colors, holes, blue cheeses etc to differentiate.
- When the player grabs a cube, a new cube will spawn on the plate.
- While the player is sorting cheese, they must also keep an eye on the background: if the home owner enters the room, they must freeze completely to avoid getting caught.
- As the player is sorting cheeses, they also get hungry. This is indicated by a growling noise coming from the player's belly. During sorting they can eat a cheese cube to avoid starving.
- Once an introductory level is done, a slow thinking task is added: the player must now also guide their mouse accomplice through a trap-filled scene by using gaze: a ray will be cast from the center of the headset to the environment and where it intersects with the environment a dot will be shown. The mouse accomplice will follow the dot as the player aims it to avoid traps.
- The player must keep sorting cubes simultaneously with guiding their accomplice. The cheese platter is located in front of them, the accomplice is visible to the side of the player's view, allowing both tasks to be done simultaneously.
- The game will slowly increase in difficulty: the first level could be simply sorting two types of cheeses, and then the homeowner is introduced, having to also eat, more types of cheeses, etc.
- Other difficulties or distractions could be:
  - Discarding cheese that is moldy, or items such as nuts and carrots that are in the way.
  - When the homeowner looks in the direction of a player, the player must quickly point their hand (controller) towards a highlighted target and hold the position until the owner looks away again. This target spawns at random locations.

Mockups and explanatory images have been shared by University of Michigan. These can be found in document *Mouse Game – explained.docx*

## **Concept 3: Distracted Sorter**

### **Summary**

In this concept the player has to break rocks with a pickaxe. When breaking a rock, the rock will split and a random gemstone will be visible. The gemstone then has to be put in one of three carts, according to the correct category.

### **Description**

Rocks will roll one by one in front of the player, who will already be holding a pickaxe. By hitting the rock with a pickaxe, the rock will split into pieces, and a gemstone becomes visible.

Gemstones could be gold, diamond, sapphire, cobalt, emerald, zircon, ...

Once a gemstone is visible, the player can grab it and has to throw it into the correct sorting cart which contains the same gemstones.

The game starts out with three gemstones to allow the player to learn the game and to get used to the VR environment.

A second difficulty will be introduced: the player could be in a mine which is haunted and slowly all surrounding lamps start flickering and dimming. Eventually they go out. Spooky ghost sounds are heard, and the player is then resorted to using the light on their helmet to look in the direction of the noises and keep the ghosts away. When the ghosts are scared away, the lights go on again until the ghosts come back.

Alternatively, the light goes out due to a technical failure and the player has to push one out of three buttons on the breaker box to turn it back on. The emergency screen on the breaker box shows which button to push. All buttons have a different symbol on them, but they are very similar at first sight.

## **Concept 4: Distracted Cook**

### **Summary**

In Distracted Cook, the player is a chef at a restaurant, and has to chop ingredients as they pop up on the countertop.

### **Description**

The player is holding a knife in one hand and will see a kitchen counter and chopping board in front of them. One by one ingredients will appear.

The player's first assignment is to cut ingredients as they randomly appear as fast as possible.

Once the initial level has been done, food has to be sliced according to a recipe. By looking at an order ticket hanging in front of the player, the correct ingredients have to be sliced. Random ingredients will appear and the player must quickly recognize the correct and incorrect items.

Additional gameplay features:

- The recipes will become more intricate, contain more ingredients and more unnecessary ingredients will be added.
- Things go wrong in the kitchen: a pan catches fire and needs to be extinguished, a rat might appear every now and then and the player can whack it.
- An angry chef has taken over the kitchen and screams ingredients that might be wrong while the player must stay focused and chop the right ingredients.
- An order ticket becomes more difficult to read: images are used for one ingredient while text might be used for another ingredient, text colors (eg. avocado is written in red letters, while tomato is written in green letters).
- Another chef asked the player to keep an eye on the oven: during the game, the dial of the oven will slowly tilt to a higher temperature. The player has to turn the dial back down again every now and then to make sure nothing burns. If the temperature gets too high, a warning sound will be heard, smoke will come out of the oven.

## **Concept 5: Cash Register Slingshot**

### **Summary**

The player is working at a returns desk in a grocery store. They must scan as much items as they can and shoot them back in the correct isles as fast as they can. If they're too slow, the items pile up and customers get frustrated.

### **Description**

The player sits in front of the cash register and has a straight view on the isles in the store. Each isle will have a picture of goods in that isle. Items will pass by on the conveyer belt.

During the game:

- The player must grab each item one by one and scan it.
- Once an item has been scanned, a slingshot is visible.
- The player must use the slingshot to shoot the item to the correct isle with the corresponding goods.
- Shooting the items to the wrong isle will result in unhappy customers and a smaller paycheck at the end of the game.
- The amount of isles and types of items can be increased as the game progresses.
- The colors of the goods shown on the isles can change, which can be confusing to the player.
- Loud alarms can go off when a customer tries to steal an item. The player then has to aim their slingshot at the customer to stop them.
- Loud announcements can play, every now and then they instruct the player to press a button near their register.

Additional difficulties and game elements:

- Once an amount of levels has been completed, the player finally gets a cash register where customers are actually buying items. They've also gained the responsibility of bagging the items:
  - Items must be scanned and then shot in correct bags. There are bags for vegetables, frozen items, drinks, etc.
  - Once filled up, the bags are shaped as 3D tetra cubes and must be placed inside the shopping cart correctly to completely fill the shopping cart, without exceeding the allocated volume. The player is able to rotate the bags and move them around in the shopping cart.