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# Game Ideas

We tried to divide the different game ideas in categories for a more detailed explanation. Each extension or game idea will then be evaluated with the following criteria:

|  |  |  |
| --- | --- | --- |
| **What** | **Description** | **Values** |
| **Impact:** | How big is the expected impact of this feature on the end user experience if it were to be implemented? | Low  Medium  High |
| **Area:** | Which area is the focus of this idea? | User Immersion  Simulation Quality  Utility  Fun |
| **Pros:** | Which positive aspects does this idea come with? |  |
| **Contras:** | Which negative aspects does this idea come with? |  |
| **Effort:** | How much effort and resources would approximately be needed to implement this idea? | Low (less than a day)  Medium (more than a day, but less than a week)  High (about a week)  Very high (more than a week) |
| **Technological risk/security:** | What is the estimation of the likelihood of unknown problems, performance limitations or the possibility of it not being achievable at all? | Low  Medium  High  Very high |

### Virtual Buzz extensions with Virtual Objects

These game ideas are targeted at the extension of the Virtual Buzz application using different virtual objects from Unity and the object recognition feature from Vuforia. They could all be implemented in the same app or simply using the features therein as a basis in a new app. Each idea also states whether it would be applicable for single- (SP) and/or multiplayer (MP) modes.

#### 1. Trafic Sign recognition

The application shows the user(s) one out of many traffic signs created with virtual objects and a stopwatch is triggered at the same time. The sign could first be shown far away and/or blurred out and then continuously become closer and clearer. Different traffic signs could be associated with different quantities of points. This could for example be done based on the importance of a sign, so identifying a stop sign quickly provides a better score than identifying a speed limit. If the stopwatch reaches a point where it is too late (sign passed/countdown expired) and the player did not recognize the sign, no points will be awarded and perhaps the drunkenness level lowered if it happens multiple times.

The difficulty could be altered by increasing the velocity, the alcohol levels and or perhaps a reduction of the countdown timer. Correct identifications under a higher difficulty level would then of course be rewarded with more points.

In a single player mode, the user could press a button on the controller as soon as he recognizes the sign. If he/she was correct, points are awarded based on the difficulty and the time it took to recognize the traffic sign.

In a multiplayer mode, the users can compete against each other and are rated either based on their scores or solely on who successfully identified the sign first. The game could be divided into rounds, each one containing for example three recognition sessions. Only the players with at least one positive recognition may advance to the next round. And in the end, the player with the most correct identifications and points wins would be chosen as winner.

|  |  |
| --- | --- |
| **Impact:** | Medium |
| **Area:** | Fun |
| **Pros:** | Simple, intuitive game rules  Playable regardless of driving experience  Simplicity of implementation (SP)  No need for a big space/area to play |
| **Contras:** | Identification done by user should be checked if correct  Possibly complex synchronization (MP)  Potential loss of the application message against consumption |
| **Effort:** | Medium (SP)  High (MP) |
| **Technological risk/security:** | Low (Controller not yet used, but simple button presses should not be an issue; traffic signs as blurred/moving virtual objects are possible) |

#### 2. Avoid Objects

The application creates and throws different virtual objects from different directions with different forms and colors at the user under virtual influence. The user must try to avoid these objects while he receives points for every dodged object and loses points if he was hit. The difficulty can be raised by increasing the user’s virtual buzz or the object’s velocity and movement. The objects for could for example not just fly straight at him but slightly change direction or at least appear to due to his drunkenness. The game can be designed not to have rounds but to increases its difficulty as long as the player is able to avoid the incoming objects. This idea would be restricted to Only in single mode.

|  |  |
| --- | --- |
| **Impact:** | Medium |
| **Area:** | Fun |
| **Pros:** | Simple implementation  No need for a big space/area to play |
| **Contras:** | User has only limited maneuverability  May not feel very ‘natural’  Has hardly any association to driving  Potential loss of the application message against consumption |
| **Effort:** | Medium |
| **Technological risk/security:** | low |

#### 3. Search for Objects

The application shows shortly an object to the user. The user has to look for the object. If he finds it, he receives points and a new object will be shown. A timer counts down, and the user looses if he doesn't find the object in the given time.

The difficulty increases based on the points and alcohol level. The alcohol level increases automatically when the user looks at certain objects and the application recognises them (using the object recognition feature from Vuforia). Each time the time is shorter.

|  |  |
| --- | --- |
| **Impact:** | medium |
| **Area:** | fun |
| **Pros:** | relative easy implementation |
| **Contras:** | Loss of the real application’s goal, avoiding alcohol consumption in youth people |
| **Effort:** | medium |
| **Technological risk/security:** | low |

### Virtual Reality Games

This game ideas combine a complete virtual reality world with the image effects simulating the alcohol.

#### 1. Virtual Reality Car Simulator

The application shows a virtual world from the point of view of a car driver under the effects of alcohol. The user can drive by steering a virtual wheel with both hands and shift up through gears with the controllers joystick.

Same as in the ASN physical devices, the driver must drive under different weather situations and avoid different obstacles or challenges. The reaction times are mesured, and after the session the player can see its reaction times compared to a sober person. Each session increases in difficulty and alcohol levels.

|  |  |
| --- | --- |
| **Impact:** | High |
| **Area:** | fun |
| **Pros:** | No infrastructure needed (physical car simulators, big rooms),  several players can play simultaneously in single or multiplayer  mode. |
| **Contras:** | High production costs |
| **Effort:** | High - A car simulation in a virtual reality application could need many resources |
| **Technological risk/security:** | medium |

#### 2. Find the way home and arrive alive

Inspired in the last Report from ASN.

The player must go home under the alcohol effects in a virtual world in a given time. The game shows the way home with different virtual object as arrows, pointing fingers, etc.

The player must walk in the right direction, maintain its walking direction, avoid obstacles, go upstairs and downstairs, recognize different traffic signals (f.e. in order to cross the street), avoid running cars, even take the bus/train and get off at the right place.

From timte to time the player must complete several tasks before it gets a hint of the way home. With the bluetooth controler he might draw a figure, point exactly to a given point, open a door (with the controller acting as the key), etc.

The game is built in different difficulty levels. The alcohol levels and duration of the way increases with each level, or an extended version of the Virtual Buzz Randomization class changes randomly the player alcohol level (higher or lower) in order to provide a more realistic feeling of the alcohol influence.

|  |  |
| --- | --- |
| **Impact:** | High |
| **Area:** | User Immersion |
| **Pros:** | Total flexibility in the creation of the environment, challenges or  obstacles. Multiplayer possible. |
| **Contras:** | A big physical area without any obstacle is needed. Interaction with  no playing persons not possible. The mobile phones capacity of  generating convincing graphics is still not enough. High production  costs. |
| **Effort:** | Very High - The creation of a detailed and interactive environment would need great ressources, same as the introduction of the controller |
| **Technological risk/security:** | Very High. There are no examples of the use of a controller with such features |

# Application of the Virtual Buzz App in real world activities

Based on the informations from ASN we describe possible applications of the Virtual Buzz application in real world activities used to prevent the alcohol cosumption in young people.

## On the way home

In this game a small group of young people and one or more advisors are involved. The group’s goal is to arrive to the home of someone’s group member by foot or public transport.

While wearing the AR glasses with the Virtual Buzz application and walking home the adolescents have to complete activities proposed by the advisors like:

**Send a message:** The adolescenst have to write and send a message with their mobile phones to each other.

**Traffig sign recognition:**  From the distance the adolescents try to identify the different traffic signs or to read the street names.

**Traffic light recognition:**  with the red distorsion feature of the Virtual Buzz application activated, the adolescents must try to distinguish in the distance the red from the green of the traffic lights.

**Catch the ball:** the adolescents play with balls of different sizes (f.e. ping-pong, tennis, basket).

**Walk straight along a line:** and advisor draws a line with chalk on the street. The adolescents have to walk along the line

**Go upstairs / downstairs**

**Unlock your home doo**r: once at home, try to open your door with your key.

## Ride a bike

This activity should take place in a closed or delimited space in order to avoid accidents. The adolescents should wear protecting elements like helmets and knee-guards.

Like in a car driving school, the adolescents wearing AR glasses with the Virtual Buzz application should try to complete one or several tours.

The tours can increase its difficulty progressively, and the same tour should be traversed with different Virtual Buzz configurations.

# Future features

After the development of the current Virtual Buzzz application and conversations with ASN, a list of possible further developments or features of the app could be:

**Inconstancy improved with focused view:** As long as the person remains still, without making vehement movements with the body or head, the blur level should decrease or even disappear. So the vision should be sharper.

But as soon as the person starts moving or shaking its head, the blur levels increases exponentially, becoming the vision blurred and even causing nausea or dizziness.

This could be implemented by using the phone’s accelerometer and gyroscope sensors to detect and quantify the movements.

**Alcohol levels increase constantly in time**: you start sober at the beginning of the evening, and as long as the evening passes you end drunk.

**Alcohol levels decrease constantly in time**: simulating the process of getting better after drinking