

# Let's tilt

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## Abstract:

Although nowadays many multitouch devices are available, there are very few multiplayer games, which can be played together on one device. The project ‚let's tilt‘ is a cooperative game, which is played by two players on a multitouch device. The application challenges the players to reach a common goal in playful and entertaining way.

‚Let's tilt‘ is an advancement of a popular game for mobile devices, where the player controls a virtual ball on the display of the device by tilting the device. Or, to be more accurate: a tilt of the device changes the gravity of the virtual world and the ball reacts accordingly. In ‚let's tilt‘ the virtual world contains various dangers, like gaps, where the ball falls down or flying objects, which will knock the ball off his track and into the gaps. The goal of the game is to bring the ball to a certain target. If the ball falls down into a gap, the round is lost. The next round starts with the ball in it's original position. While player one tilts the device in order to control the ball, player two is given a tools, which he can use to avert dangers or to get the ball to its destination more efficiently. These tools are controlled by moving two fingers on the touch surface.

## Related work:

The question of this project is, how a multitouch device can enable the users to complete a task in a collaborative way. To put this question in concrete terms, it is necessary to specify the term ‚collaboration‘. Weiss et al. (2011) differentiate three collaboration dimensions for multitouch devices: „Joint Performance where collaboration is the performance of joint actions, Sharing where collaboration is the sharing of personal resources to achieve a common objective and Mutual Planning where collaboration requires formulation and performance of a joint plan.“ (Weiss et al. 2011: 71) Based on their study of games, which run on a multi-user tabletop surface to support social competence training for children, Weiss et al. (2011) examined „new modalities of interaction: multi-user ‚cooperative gestures‘, co-located interactions where the system interprets gestures of more than one user as contributing to a single, combined command“ (Weiss et al. 2011: 71). As a follow-up to Weiss et al. (2011) this project explores a new possibility to demand joint performances in a collaborative multitouch game.

Peltonen et al. (2008) come to the conclusion, that users enjoy using a big public multitouch display together, carrying out parallel and joint activities on the screen. Some users were observed to use the interface in a playful way, allowing for the primary

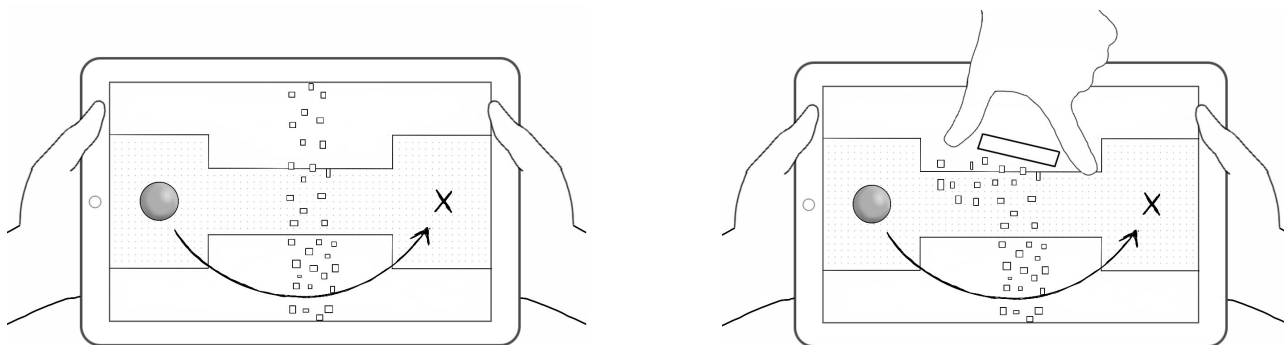
purpose of the software to drift into the background. Two users even made a game out of performing the pinch-to-zoom-gesture together. Furthermore Peltonen et al. (2008) observed, a problem which today is generally known in the research on multitouch devices. When many users interact, without paying attention to what others are doing, it sometimes can become impossible for everybody to interact anymore. Peltonen et al. (2008) observed, that users sometimes scaled their own image very large, thus covering the space, where other users were interacting.

Findings like this suggest, that a joint usage of multitouch devices could be both, a way to reach a certain goal together and a way to overcome the problem, that users tend to not pay attention on what other users are doing. Thus, exploration on how a joint usage of multitouch devices could look like, is needed.

### Scenario Description

This project is best described as a further development of a commonly known game for handheld devices. This position sensor is used to mimic a balancing-game, where players control a steel ball in order to get it to a certain destination. The players control the ball, by tilting the surface, the ball is moving on, thus changing the direction gravity operates on the ball. In ‚Let's tilt‘, there are some areas, where the ball does fall down. The players have to avoid these areas in order to reach the destination. Flying particles are another danger, which players have to cope with. If the steel ball gets hit by one of the particles, it's very likely, that the steel gets pulled off his track and falls down. While player one tilts the device in order to control the ball, player two is given a tools, which he can use to avert dangers or to get the ball to its destination more efficiently. Two tools where implemented in the scope of this project: the brick and the forcefield.

*The brick:* By touching the screen with two fingers, the player two creates a small brick and move it around in the game. By moving the brick, the second player is able to deflect the particles, thus creating a safe space for the steel ball. In addition to that, the brick can be used as an additional wall, which prevents the steel ball from falling down.



*The forcefield:* By touching the screen with two fingers, player two creates a forcefield, which attracts the ball and is a lot stronger than gravitational forces. When the ball reaches the center of the forcefield, the forcefield is destroyed. By moving the fingers on the touch surface, the second player moves and scales the forcefield. The forcefield

can be used to accelerate the ball in a certain direction, thus getting it out of a dangerous area. But the forcefield needs to be used with care, because if the ball gets to fast, it is more likely to fall into the gaps.

Technical details:

Software:

- Processing 2.2.1
  - PBox2D
  - Ketai
  - Toxiclibs
- Blender

Hardware:

- Multitouch tablet with position sensor and android

Pros:

Interactions in the game resemble actions in the real physical world, what makes the game more intuitive to play. Like in the real world, tilting the surface results in a movement of the ball into a certain direction. Likewise, using your hand to put a brick onto the surface will cause moving objects to bounce off that brick. ‚Let's tilt‘ challenges the players to collaborate and to perform joint actions to reach a common goal. Because it can be played together on one device, players are challenged to find a common way to interact with the device, which is a fun and social task.

Cons:

The joint usage of the device is also the downside of the whole game concept. When player one tilts the device, it sometimes can be hard for player two to still be able to reach the touch surface. Whereas, when player two touches the surface, it can be hard for player one to see the screen, because his view is obstructed by the hand or the arm of player one.

Future Work:

Future versions of the game could improve the joint usage of the device. One possibility to overcome the shortcomings of the joint usage would be to let player one perform the tilting on a separate device. However, this solution contradicts the main idea of enabling the players to play together on one device. Other solutions are to avoid the shortcoming of the joint usage already in the level design. In the future, different level designs should be tested to find out, which design are easy to play and which ones are not. Additional markers, where there players should position themselves around the tablet could also facilitate the joint usage.

In the future, additional second player tools should be implemented. This could include

a glue, which the second player can use to slow the ball down or a reverse force field, which the second player can use to repel the ball. It could improve the gameplay, if you let player two choose the tools or change them during the game. Furthermore, additional dangers should be implemented. This could include stationary force field, which pull the ball off his track, wind, which changes direction from time to time or conveyor belts, which move the ball to a dangerous area.

## References

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