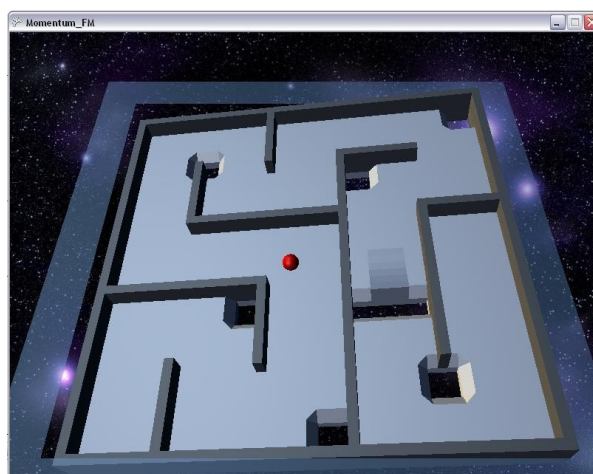


Momentum – Prototype Chapter

We decided to create our prototype directly in XNA so we can later reuse and extend it to our final game. The prototype is playable and includes the essential elements of the gameplay as well as real world physics and collision detection. Thanks to the physics it is possible to load any level and play it without further adjustments. We implemented single player Classic Mode, as well as multiplayer Momentum Mode.

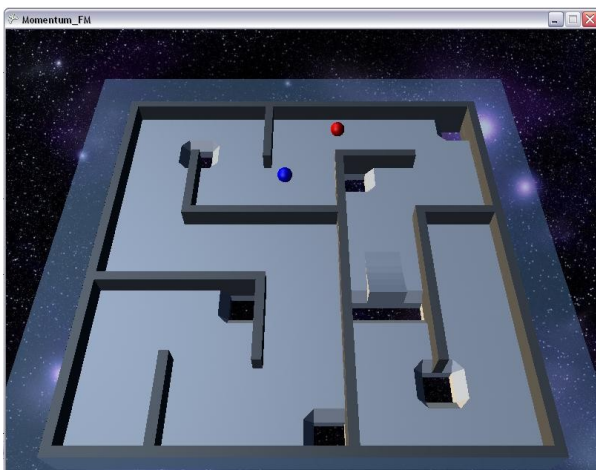
Classic Mode

The player can direct his ball through the maze by tilting the board with the thumbstick of the controller.



Momentum Mode

Up to four players compete in a race, controlling their ball directly. Momentum Energy is released by pushing the A button, the balls then move with double speed. In this prototype version Momentum is available in infinite amounts to every player. In contrast, the final version of the game will require the player to collect Momentum by moving his ball without hitting obstacles. If a ball falls into a hole, the player can tilt the board and make it harder for the others to finish.



Collision detection

The collision hierarchy is created while loading the model data of the level. In order to do that we had to implement our own custom model processor. For the level polygonal collision is used. The balls are represented as bounding spheres when collision checks with the level are done.

Physics

After collision is checked, each triangle normal determines the force applied to the ball. Yet only simple sliding physics are implemented.

Lessons learned

- We have to think about a way to bring more dynamics into the game by moving the camera. The static view is a bit boring.
- Boards that are not flat, but go more into 3D would make the game more interesting, for example different height-levels or tunnels. Some elements could be semi-transparent in order to keep the balls visible.
- The controls of the balls and the board tilting have to be well balanced, such that tilting has an influence, but the balls are still controllable.
- To further test the physics it is necessary to create a set of different testing levels, which is one of our next steps.

