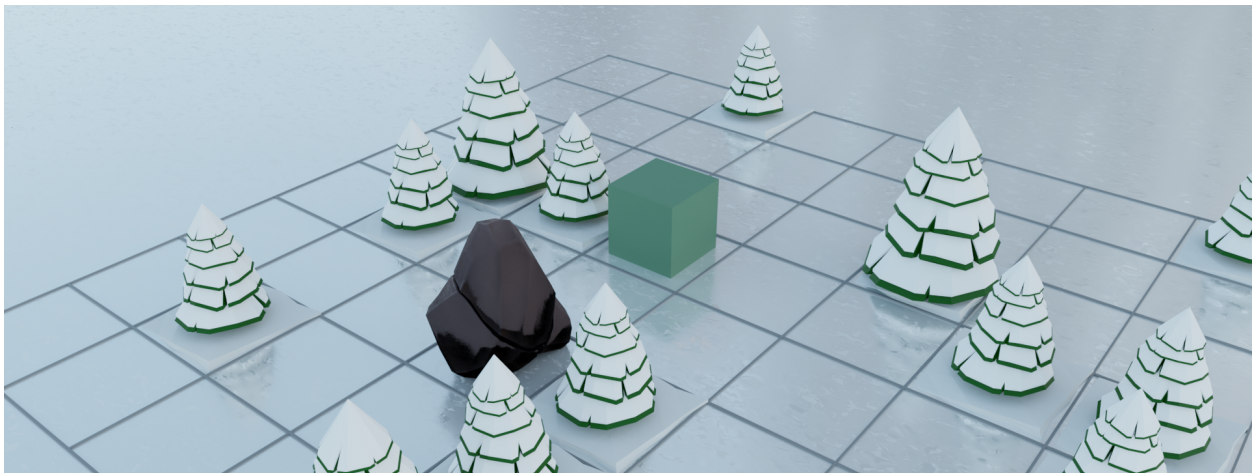


Playtesting: qubi

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1 Final Version of qubi

Since the conclusion of the playtests we have added a plethora of aspects to qubi. In the following we will cover the additions in regards to technical aspects and content.

1.1 Technical Aspects

During development we noticed aliasing artifacts at the edges of tiles. To counteract these we implemented multisample anti-aliasing. The number of samples that would be used per pixel was determined by picking the highest sample count that is supported by the used graphics card (up to 8).

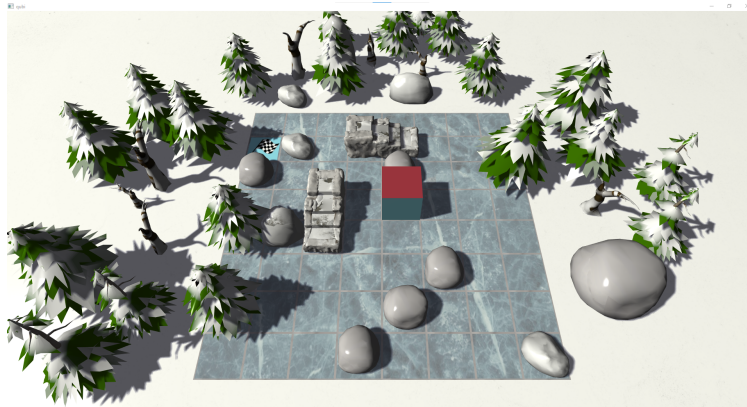


Figure 1: Initially there are only slippery tiles and obstacles. Players have to maneuver the cube to reach the finish.

Additionally to deal with artifacts in textures, especially for written text, we implemented mipmapping. The number of levels in the mip chain for each texture was calculated using its resolution.

To make the game feel more alive, we also added a directional sun light that casts shadows into the scene. This is done using shadow mapping, and rendering the scene from the lights perspective into a depth image in the first render pass and when shading the actual scene in the second render pass, use in the depth image to determine if a fragment is in shadow. Furthermore to smooth the shadows a bit we sample the texels around the corresponding one in the depth image (PCF) to achieve a smoother transition from shadow to lit surfaces.

The scenes were designed in Blender and we wrote a custom exporter that exports the whole scene into a format that can easily be used for our game. It proved to be very convenient to design the scenes in a 3D program and with the push of a button be able to export the scene into a format that can be used by the game right away.

1.2 Content

In qubi players have to maneuver a cube through tile-based levels filled with obstacles to reach the finish. On slippery tiles the cube will slide until it encounters a wall, obstacle or dry tile on which the cube would flip. In certain levels finishes require a specific side of the cube to land on prompting the player to use the dry tiles to reorient the cube.

Later on levels require the cube to be unfolded on dry tiles which can be performed by holding the space bar. Letting go will have the cube refold on the last reached tile. As a result finish tiles can be reached



Figure 2: Moving onto and from green dry tiles will have the cube flip. In these levels finishes require a specific side of the cube to land. Here the red side of the cube is required.

now which otherwise would be impossible to get to. Furthermore levels can also feature multiple finish tiles on which the cube has to land on a specific side by using the unfold mechanic. Actions can further be undone by pressing 'U'. As it was a common suggestion during playtests, we have added the arrow keys for controlling the movement of the cube (apart from the WASD keys). In total qubi consists of 21 levels for players to traverse through. Initial levels only consist of slippery and obstacle tiles. Later on dry tiles are added as well as finish tiles requiring a specific cube side. In the final portion of the game we introduce the unfold mechanic along with the option to undo an action. For the playtests we introduced both these mechanics in the same level. This was also the level that our testers struggled with the most. Because of this we added more introductory levels for these gameplay mechanics.

Additionally there is a starting level in which players maneuver the cube to tiles that start a brand new game, continue or quit the game. This level can also be accessed by pressing the escape key.

2 Experience During The Class

qubi was designed to be a cozy puzzle game that could be enjoyed every now and then. We wanted the game to show the fundamental instructions but still require players to experiment with the game to fully understand the mechanics. All in all we believe that we did a decent job with this game. The three gameplay mechanics themselves are simple. The instructions are enough to give players a spark to get started but not reveal everything about the game's mechanics. The levels ramp up in difficulty as the three mechanics are progressively added. And finally the music and sound effects are satisfying and calming.

Since we were working on the engine and qubi at the same time, we had to set priorities. To meet milestones we put functionality above everything else during development. Therefore for the most time qubi looked rather minimalistic. Once we were done with that, we started adding assets to our game.

As we initially anticipated, the development process did not always go according to plan. Features constantly had to be revised and delayed. Ultimately we used the milestones and deadlines to set goals and then worked our way through.

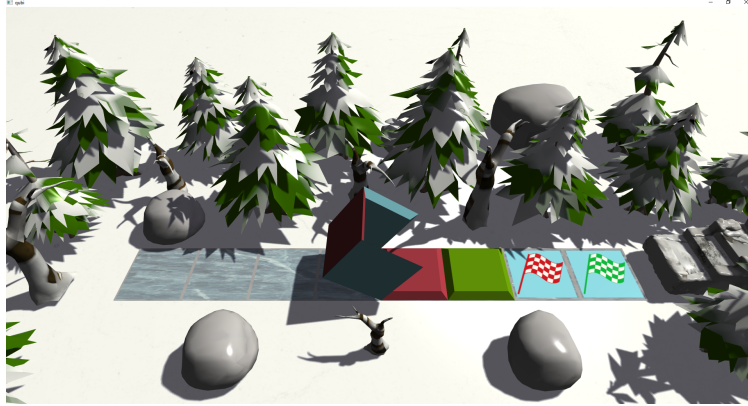


Figure 3: For levels that feature multiple finishes, holding down the space bar will have the cube unfold. This mechanic can only be used on dry tiles.

3 Personal Impressions

The theme "wet & slippery" at first seemed a little daunting to us. However the idea of a cube sliding on ice already seemed fulfill the theme. We were then able to be more creative with working out more mechanics. As a result the theme was not as restrictive as we initially thought.

The biggest technical difficulty would be building our engine while developing the game. We had to implement features for game development that are taken for granted in an existing engine. Thanks to the simplicity of our game we were able to juggle both the development of our engine and game. As the engine was made specifically for qubi, we were able to leave out features that were not needed (e.g. a graphics engine). As qubi is more of a casual game, we wanted to port the game the mobile devices. Unfortunately due time restrictions we were not able to achieve this. Therefore qubi is strictly a PC game. Of course there were several other ideas we had for the game, such as different worlds, a reward system or verticality. But with the time restrictions we made the decision to focus on refining the mechanics we had instead of creating more aspects half-heartedly.

In regards to the course organization we feel that how the milestones and their deadlines were handled were a little confusing. We feel that the project structure document in the course materials for one should be updated again as at some points it seems to contradict itself. The deadlines for the milestones could further be communicated better.