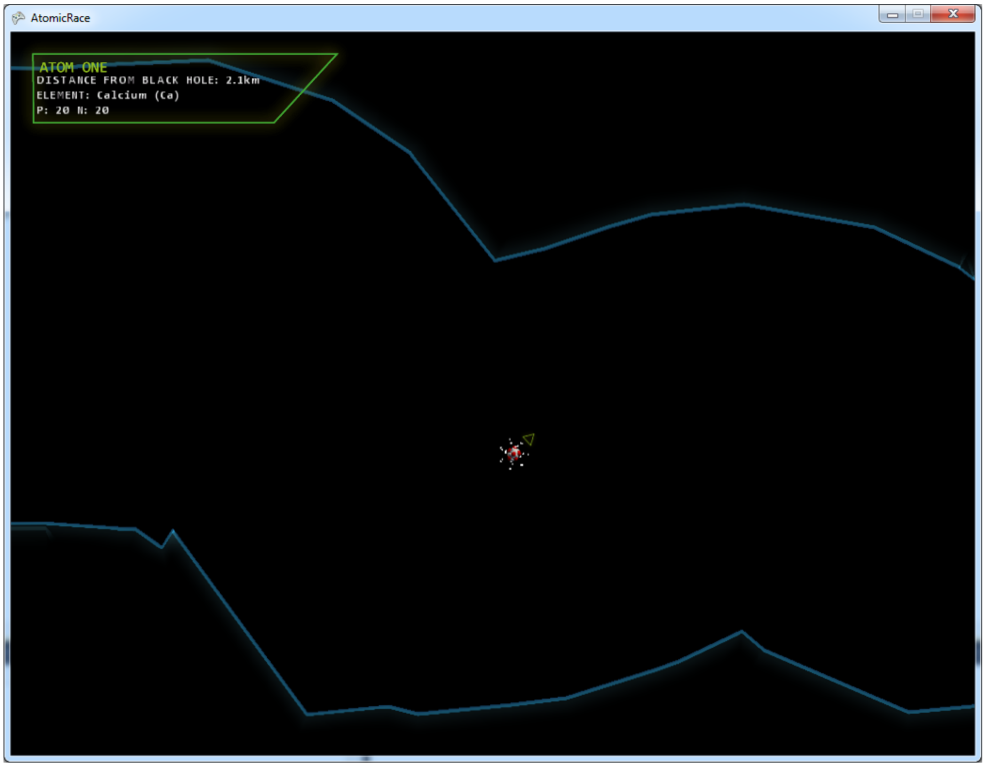
Interim Report: Atomic Race

Gameplay

In a very first version, the gameplay was implemented. The player was able to interact with atoms and move around in the level. Very early in this phase, we recognized that we could not use the Electrical Potential to compute the atom pole interaction. Since the difference in the charge isn’t high enough to allow an easy interaction. There is still a lot of game balancing work needed to achieve best possible fun and challenge for our game.

Level

As we have a infinite level length we needed to implement a level generator which dynamically creates the level parts. We came up with a solution which allows us to tune this levels based on a couple of parameters. It turned out to be far more difficult than first expected. Now we are also trying to add predefined level parts in order to add some more complexity and difficulty. The auto generation of the level is achieved with the help of a polygon clipping and a triangulator library. To get good performance we are using an additional thread to create the level parts on the fly.



ATOM ONE
DISTANCE FROM BLACK HOLE: 2.1km
ELEMENT: Calcium (Ca)
P: 20 N: 20

Physics

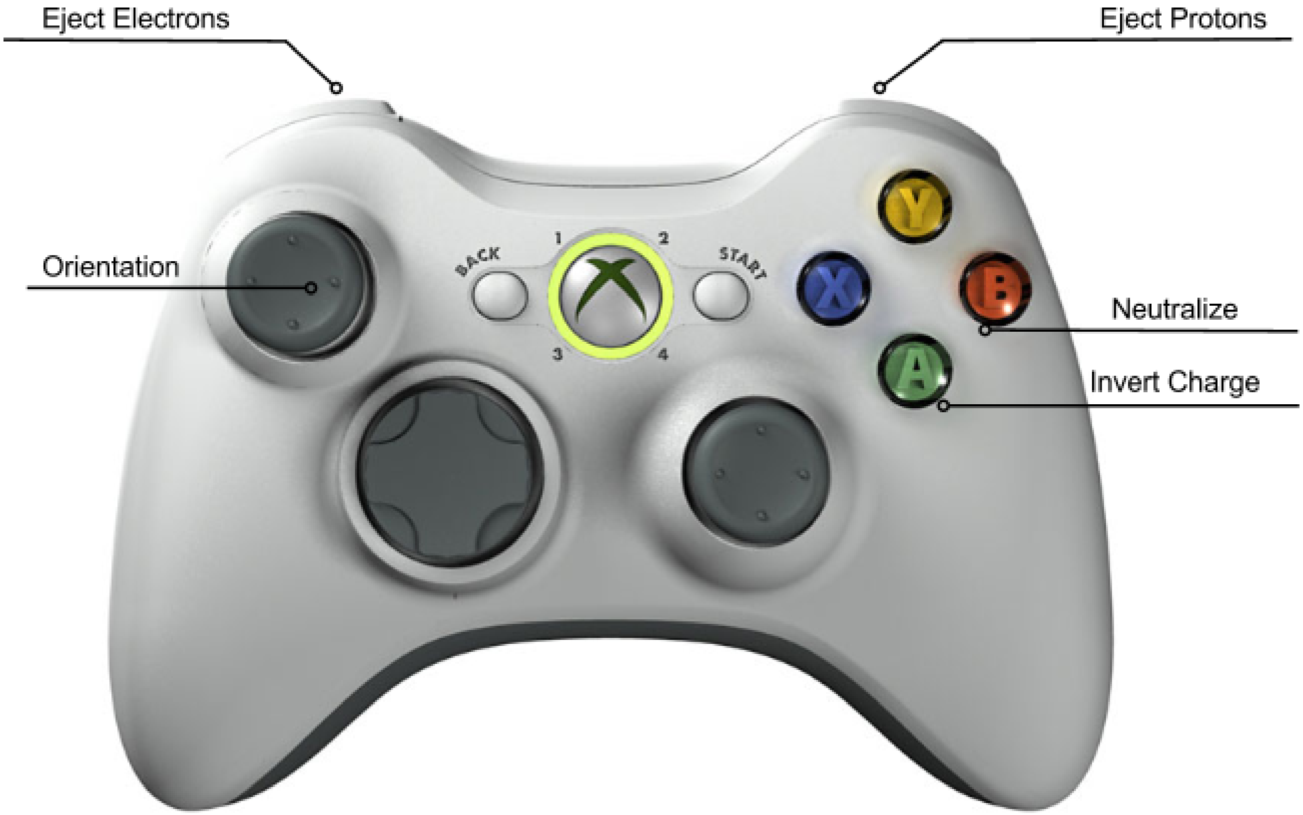
We faced a lot of problems creating a collision detection algorithm. We could have used a framework like farseer or box2d. In the end we decided to go with our solution, since we already spent a lot of time implementing it. This also allowed us to implement a very efficient solution only using our polygons points of the level and the atom's radius.

Performance

In order to prevent lags caused by the garbage collector we implemented a thread save resource pool which takes care about all the instances of the used classes.

Controls

We decided to slightly change the controller settings:



Because we found that using to top buttons to eject the individual particles to be easier.

Graphics

From the beginning we decided to go for minimalistic two dimensional graphics which are beautiful through their simplicity. It is not easy to achieve this goal though.

The first problem to overcome was to render the level boundaries which the level generator outputs as polylines. As we only want to draw the borders we had to convert the polylines into something drawable, in other words triangles. This is done by computing normals at the line points to construct quads over the edges. Until now this leads to a slight stretching of the drawn textures. We hope to fix this in a future release.

Furthermore we wanted to have some particle effects like explosions to have more interesting graphics. We use the mercury particle library for such effects. The problem with mercury is that it only supports screen space coordinates without camera movement. Therefore we had to adjust the library a bit to include a transformation matrix in the drawing process. We also implemented custom modifiers for the particle effects to visualize force fields.

Graphics Outlook

During the implementation of the current stage we came across the combination of music and graphics. We thought of colors pulsating in the beat of the soundtrack or speed changes according to the style of the music. We hope to implement some of this ideas in our final game.

Where we are

Functional minimum	**achieved**
Simple Single-player	achieved
Simple Graphics	achieved
Fully functional controls and game mechanics	achieved
Trivial level design, no obstacles	achieved
Low target	**partially achieved**
Simple Multi-player	achieved
Simple obstacles	achieved
attraction and repulsion poles	achieved
vector flow fields	achieved
High score	**partially achieved**
Desirable target	**partially achieved**
Full Multi-player	partially achieved
Appealing graphics	partially achieved
Complex levels	achieved
High target	**started**
Full Single-Player	partially achieved
Special graphic effects	partially achieved
Various obstacles	not started
Co-op multi-player mode	not started
Extra	**not started**
In-game help structure (like tutorial levels, etc)	not started

extra graphics	not started
story	not started
The concept of heat	not started
Molecules	not started

Major Changes

- We decided that we want to focus on the creation of a puzzle like game rather then a fast paced racer as this did not work out well in the first testings and does not fit to the other concepts we had in mind