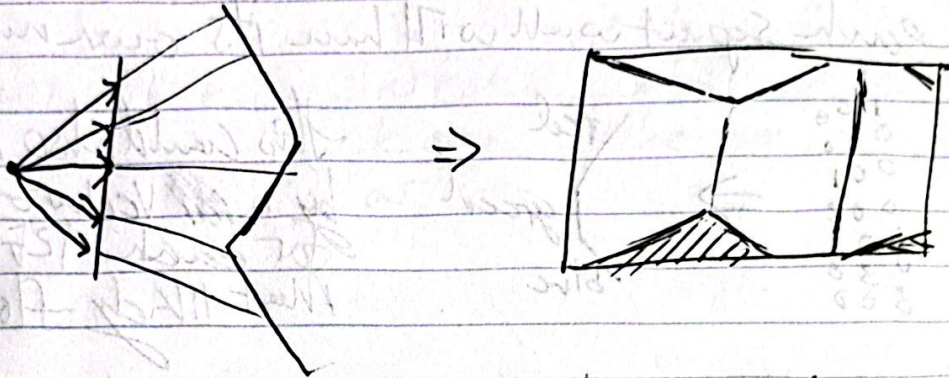# Plans for First Person Render
Andrew Rohde

Cast Rays from location to image pane in horizontal direction for each x direction pixel
Determine height of wall and y cord of wall based on distance

- Camera will be defined by an (x,y) location
- image pane will be defined by an FOV and a distance from the camera

Positions will be defined by a Vector that is effectively just a position.

A Ray will be defined by an origin and a direction, each given by a vector.
direction will be given as a Unit Vector (length of a single unit)
Units are not to be defined.
each ray will be turned into a line of parametric function of t.

$$\vec{r} = \vec{r_0} + t\vec{v}$$ where $\vec{r}$ is the line, $\vec{r_0}$ is the origin, and $\vec{v}$ is a unit vector of direction for the ray.

After walls are developed there will be some way to determine if the line intersects the wall and at what distance this will determine the color and the other properties of the vertical slice of pixels

Walls will be initially detailed by a 2D array of integers with ~~0000~~ 0 being open space and any positive number being a wall.

Each separate wall will have its own number

```
1 0 0
0 1 0      } red
0 0 1
0 0 2      } green
0 0 2
0 3 0      } blue
3 0 0
```
⇒

this could also be detailed by a vector of 3 dimensions for each RGB value? Most likely floats ~~~~ [0-1]

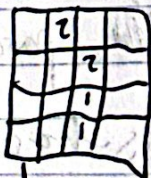~~●~~ height of wall will scale with the distance t that the camera is from the wall.
Unsure on the specific factor but that will have to be experimented with.
The height that the wall is from the floor will also need to be scaled.

Will also need some way of developing a ~~~~ line for the wall.

Simple enough but what about 2 walls?

there is a gap that forms.

most probable solution would be to extend each wall by an extra cell

~~~~

if we can see the ~~~~ gap is no longer visible.

Though this does bring up another point.
what if the line sees 2 walls in its path?
Set the color to whichever wall is closer.
And if the ray/line happens to see the seem of the
walls (this being where the 2 walls intersect)
then we will pick one of the walls arbitrarily
to show the color of.