Change and improvement:

1. Add 2 textures as uniform variables in the shader, they are texture-map and normal-map, which loaded by SOIL.
2. Pass the TBN vectors to the shader of each vertices, to compute the TBN matrix in the shader and use the right normal of the normal-map.
3. Delete the color attribute in the VBO and add UV attribute in the VBO(smaller the UV by a little float value to avoid the error caused by approximation of float).
4. Add a time count in MyGL and a u\_Time in the shader(0 ~ 150) to realize the floating of the WATER and LAVA.
5. Use Blinn-Phong shader to compute the color.
6. For extra credit: I create a .png file called miniminecraft\_cosine\_power\_all.png in miniminecraft\_textures\_all folder. This png is to record the cosine power of the different textures. The r of the color’s rgb is the cosine\_power, the shininess equals cosine\_power \* cosine\_power. (the iron inside the stone is more shiny than the stone and the coal inside the stone is less shiny than the stone)

DIRT,WOOD,GRASS,LEAF: 256

STONE: 8

BEDROCK: 7

COAL inside the STONE: 256

IRON inside the STONE: 4

LAVA: 9

WATER: 4

1. Make some optimization of the render, we only render the chunks which is inside of the screen.