

## Project 03: Camera Intrinsic and Extrinsic

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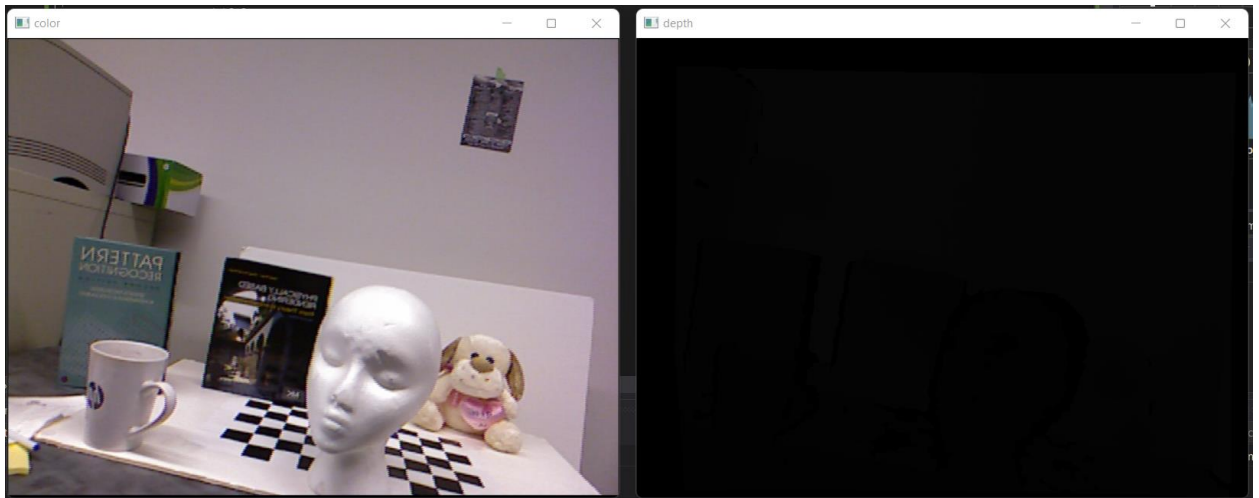
#101709607

### Achieved:

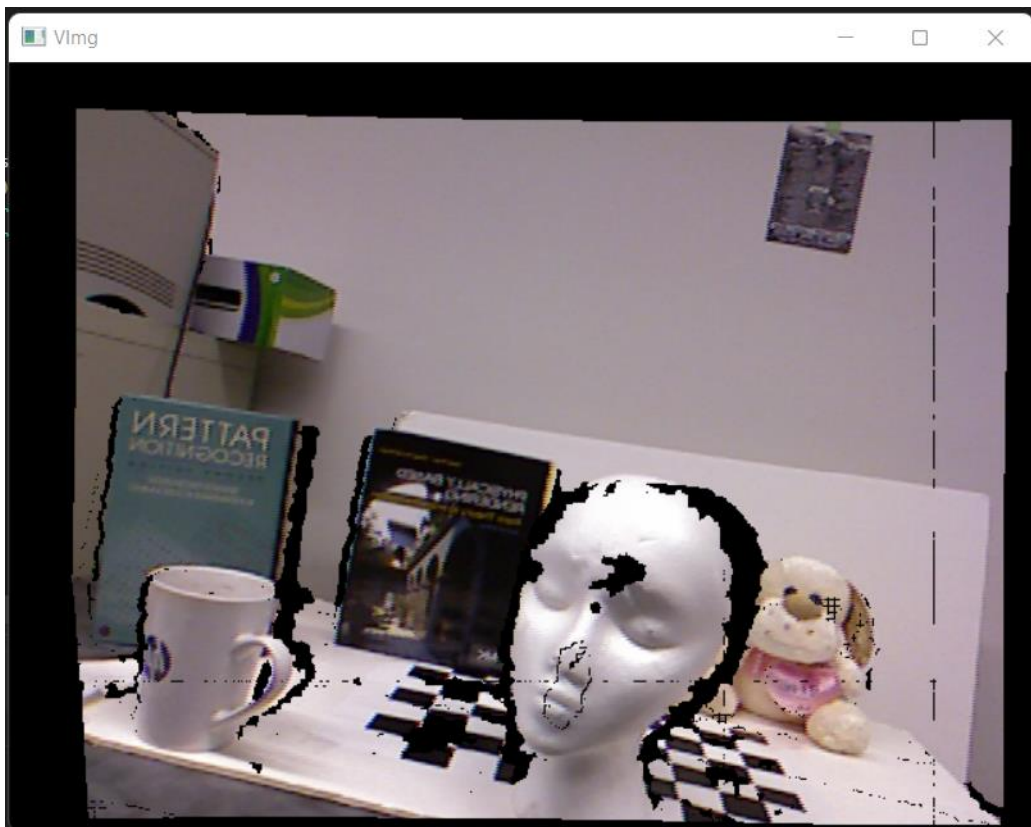
1. Successfully loaded the color image and depth image.
2. Rendered the virtual image using the color image and depth file.
3. Successfully used the keyboard to update cameras intrinsic's and extrinsic's to change the virtual view.
  - a. Translated camera by 10 units along X axis on pressing 'a' in keyboard
  - b. Translated camera by -10 units along X axis on pressing 'd' in keyboard
  - c. Translated camera by 10 units along Y axis on pressing 'w' in keyboard
  - d. Translated camera by -10 units along Y axis on pressing 's' in keyboard
  - e. Increased the focal length by 30 units on pressing 'z'
  - f. Decreased the focal length by 30 units on pressing 'x'
  - g. On pressing 'r' camera extrinsic's will be reset.
  - h. On pressing 'o' the virtual image will be saved to local as JPEG image.
  - i. Rotated the image about X axis clockwise or by 5 degrees when 1 is clicked.
  - j. Rotated the image about X axis anticlockwise or by -5 degrees when 2 is clicked.
  - k. Rotated the image about y axis clockwise or by 5 degrees when 3 is clicked.
  - l. Rotated the image about y axis anticlockwise or by -5 degrees when 4 is clicked.
  - m. Calculated necessary matrices for arbitrary rotation along arbitrary line
  - n. Rotation along the arbitrary line L both clockwise and anti-clockwise by 5 degrees

## Screenshots:

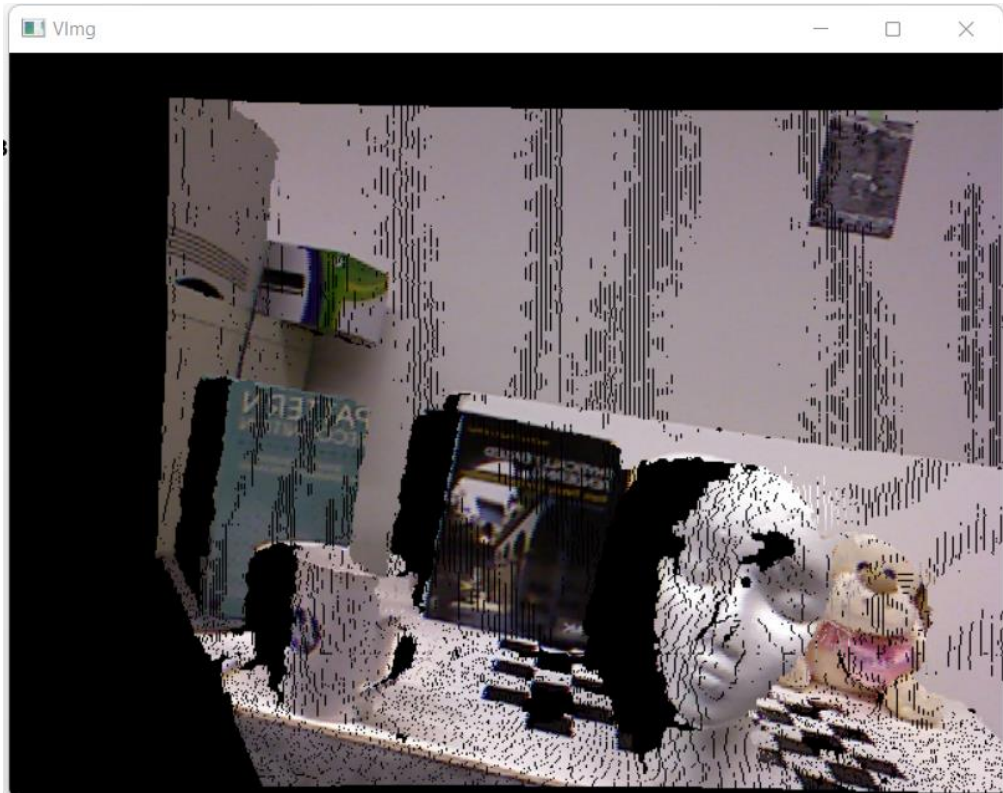
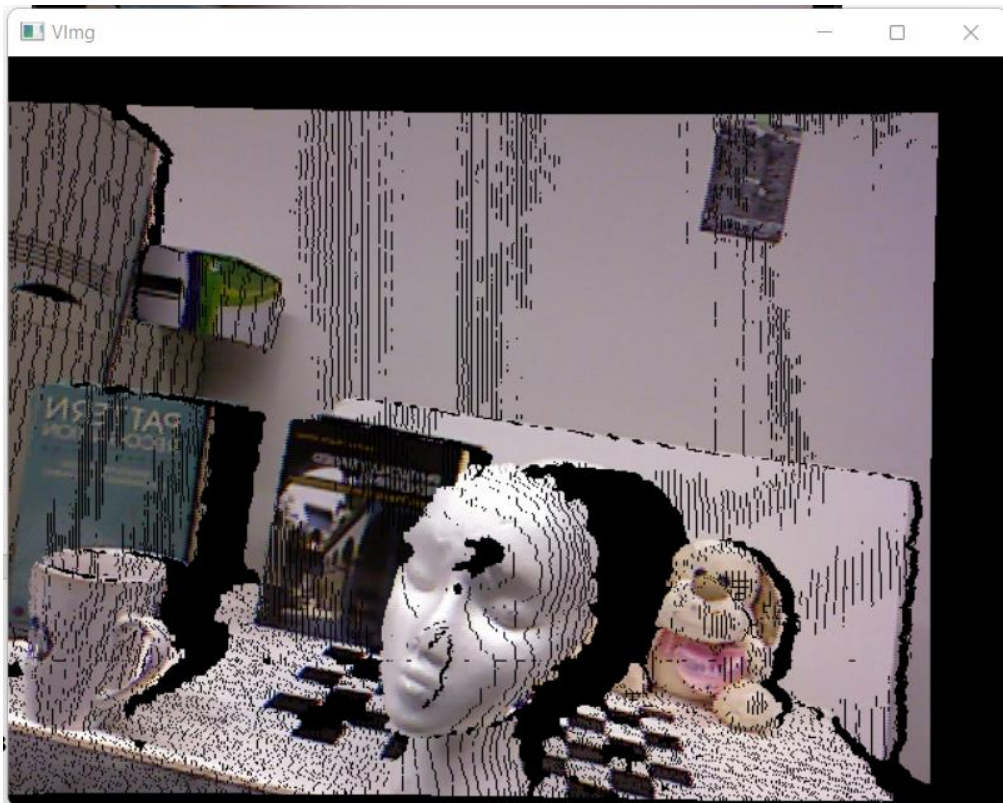
### 1. Displaying Color image and Depth image



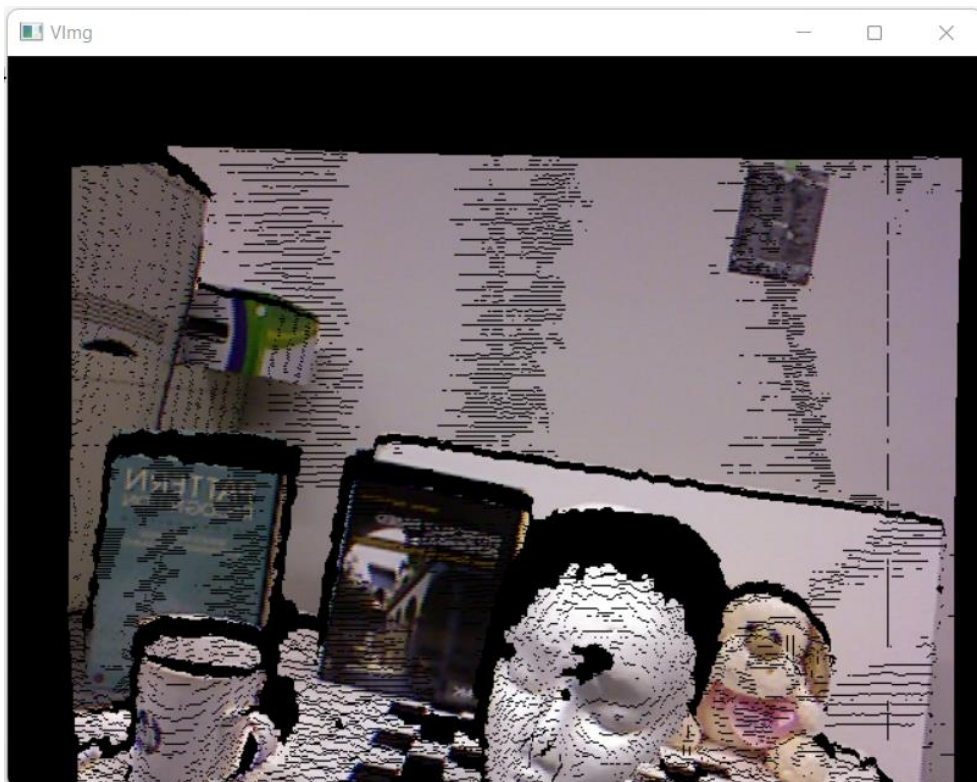
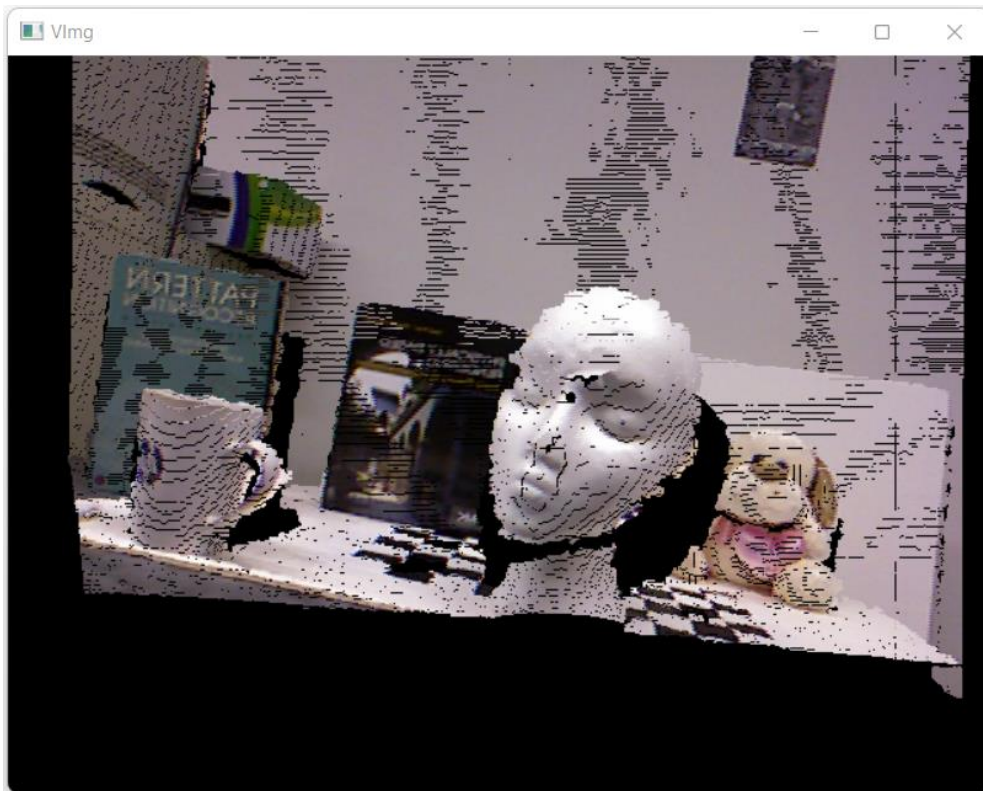
### 2. Initial Virtual Image



### 3. Translation along X-axis

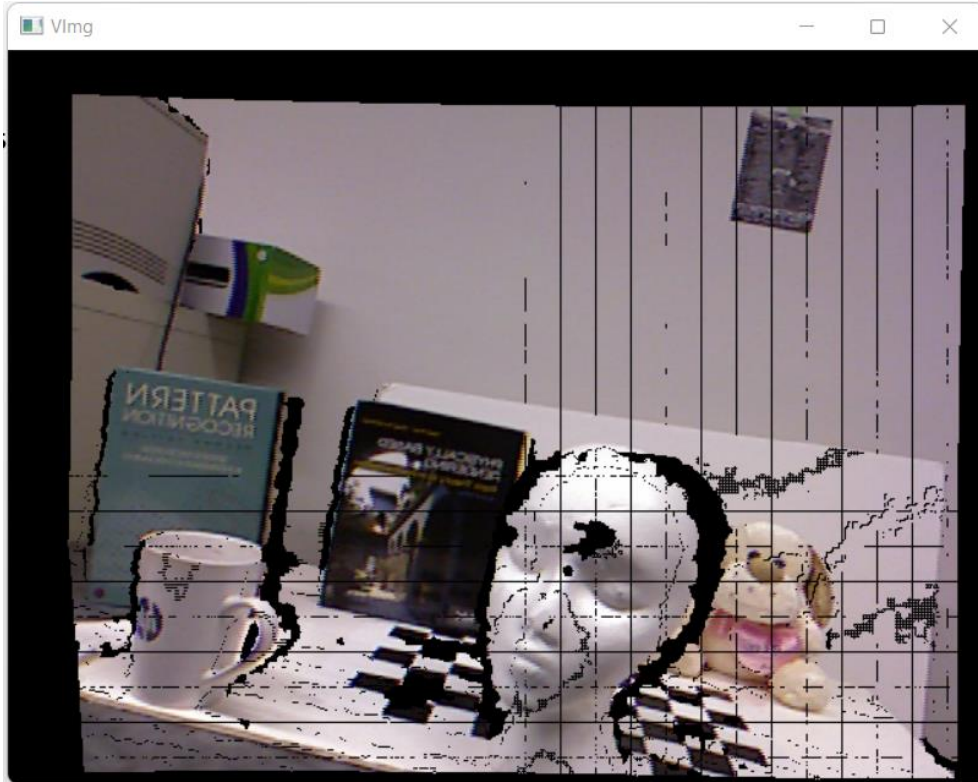
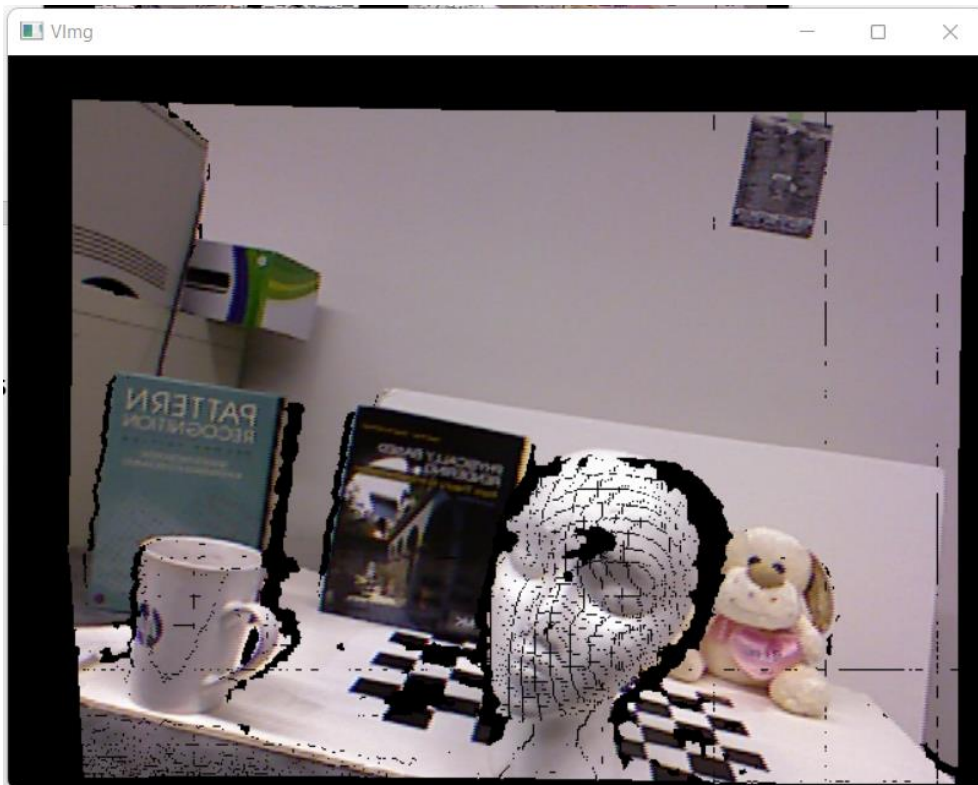


#### 4. Translation along Y-Axis

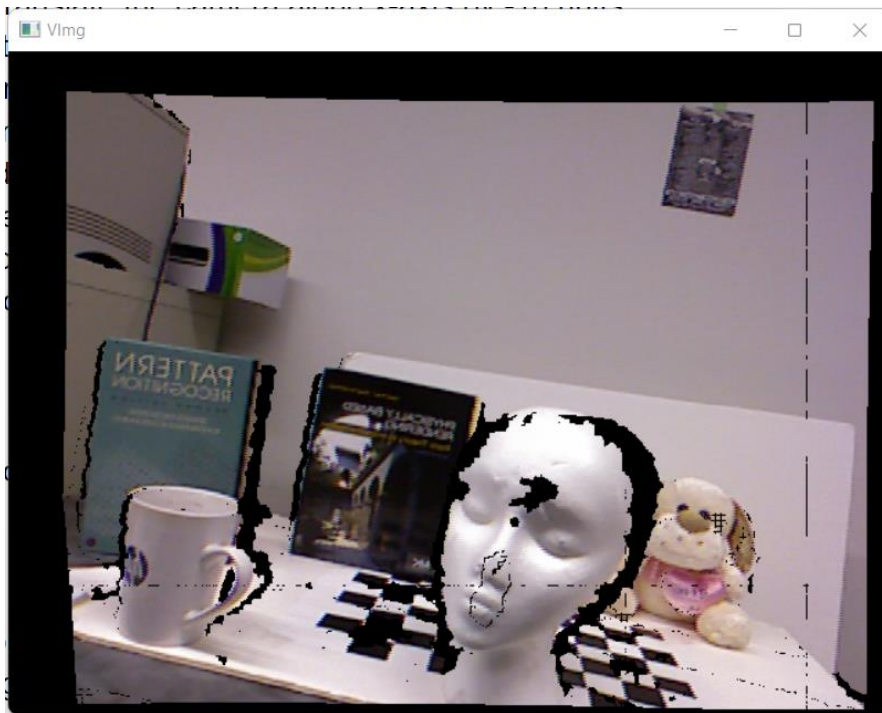




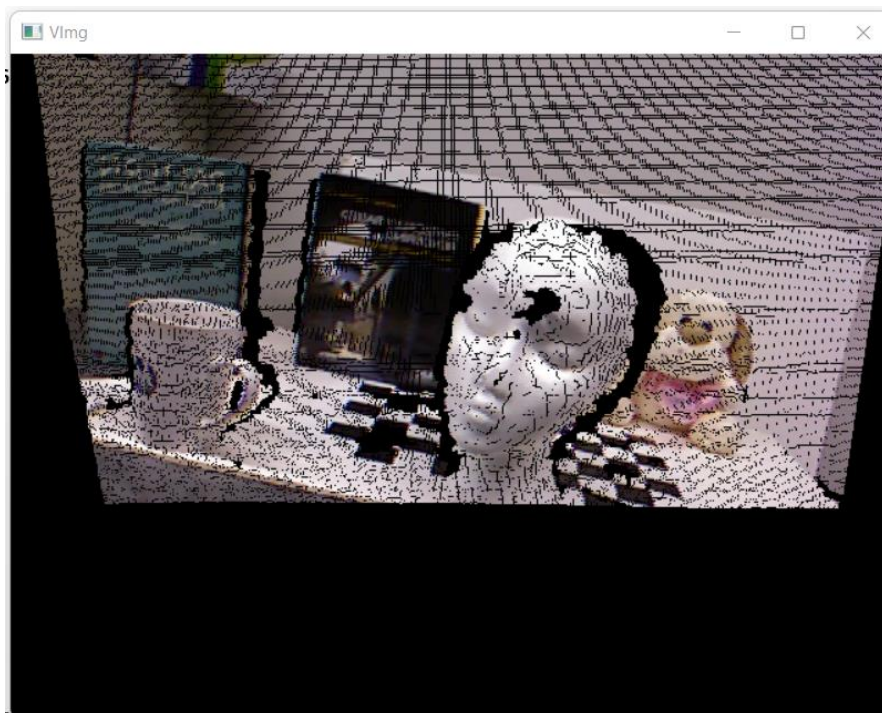
## 5. Increasing & decreasing the focal length



## 6. Reset the Virtual Image

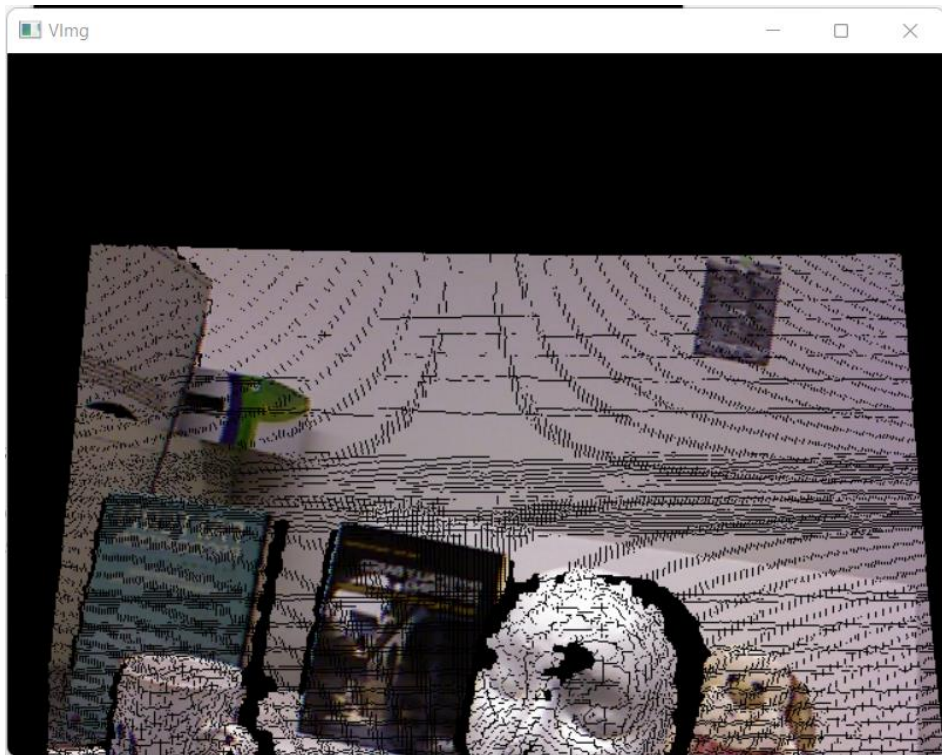


## 7. Rotate the Image about X-axis Clockwise

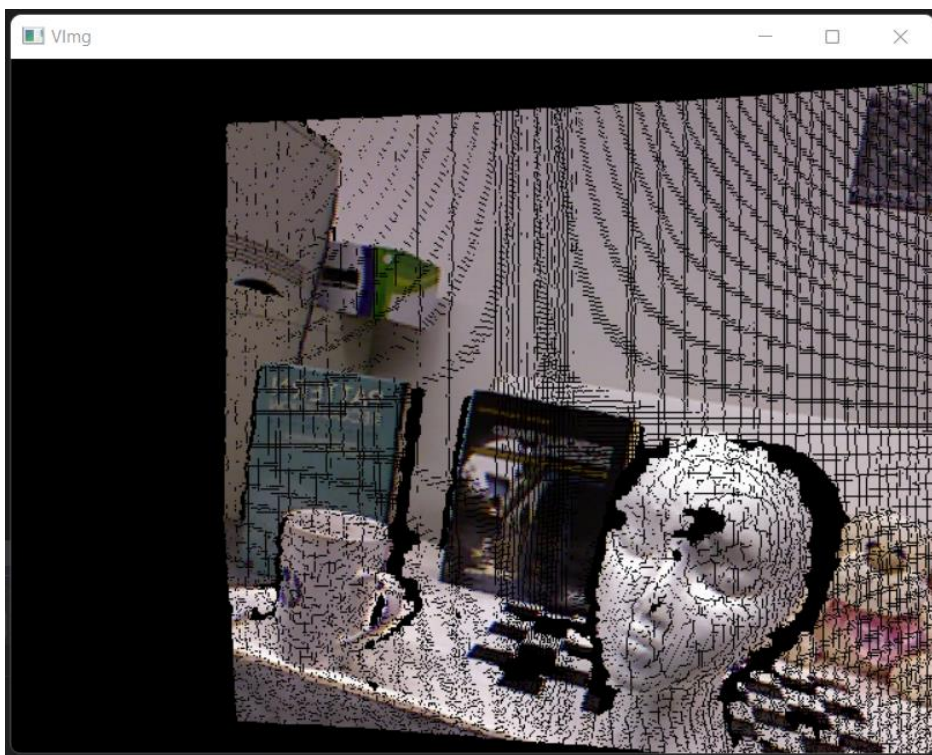




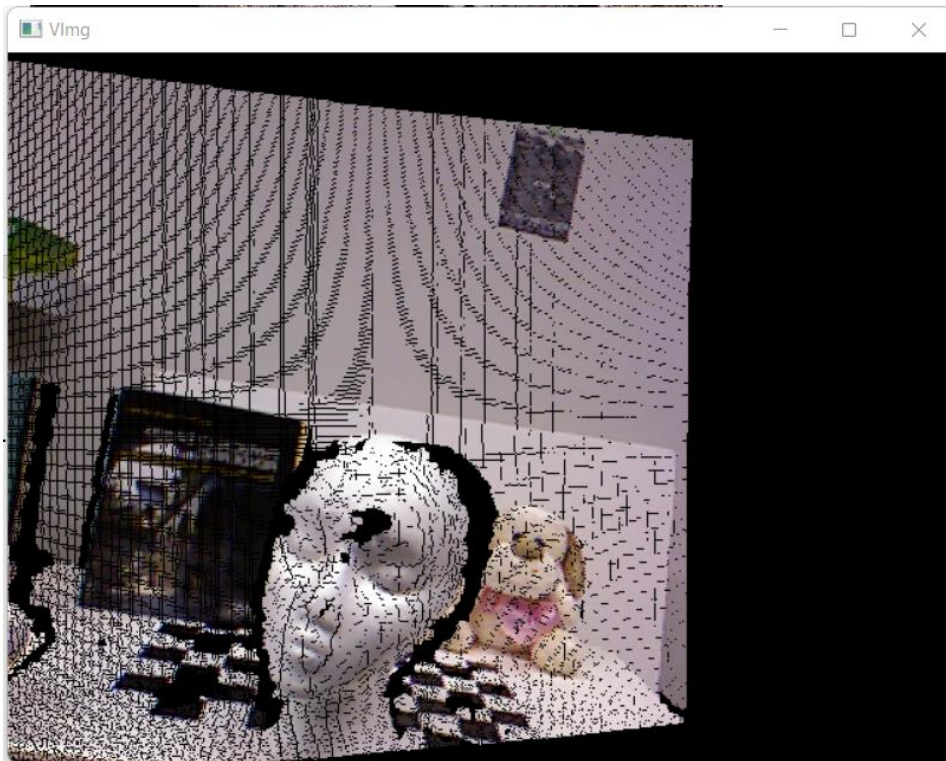
8. Rotate the Image about X-axis anti Clockwise



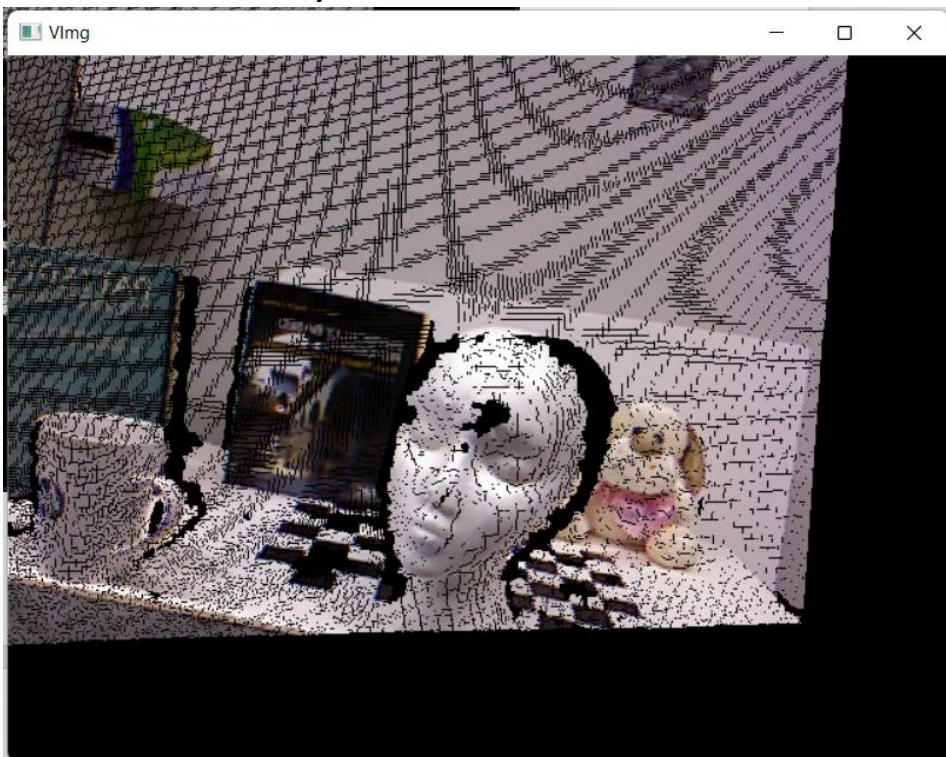
9. Rotate the Image about Y-axis Clockwise



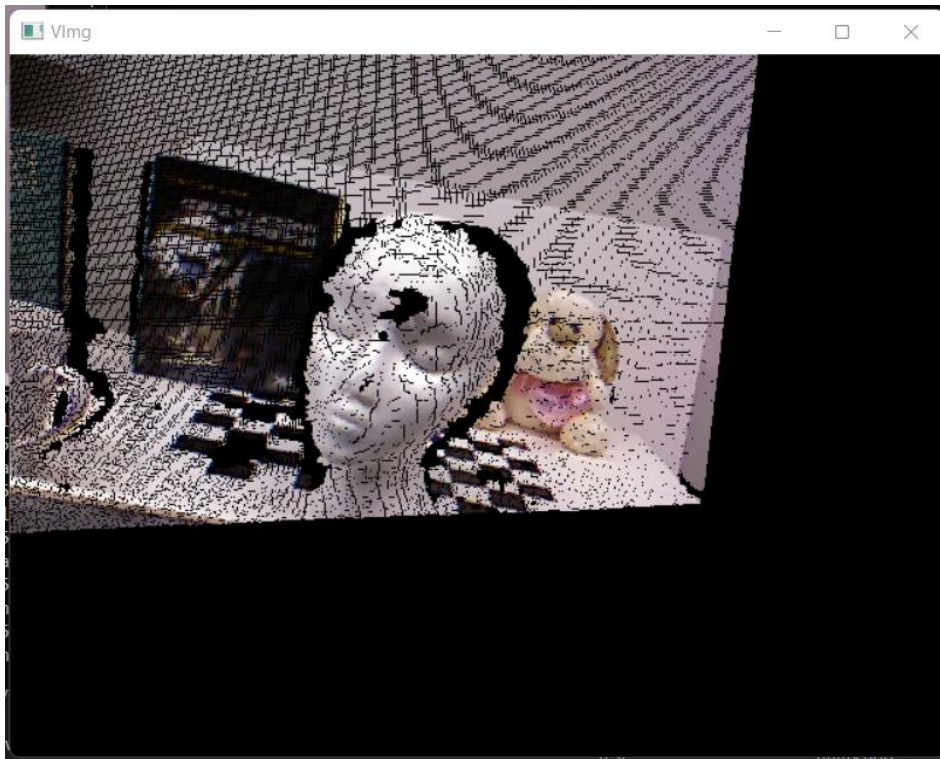
**10. Rotate the Image about Y-axis anti Clockwise**



**11. Rotation about arbitrary line L in clockwise**







12. Rotation about arbitrary line L anti clockwise

