

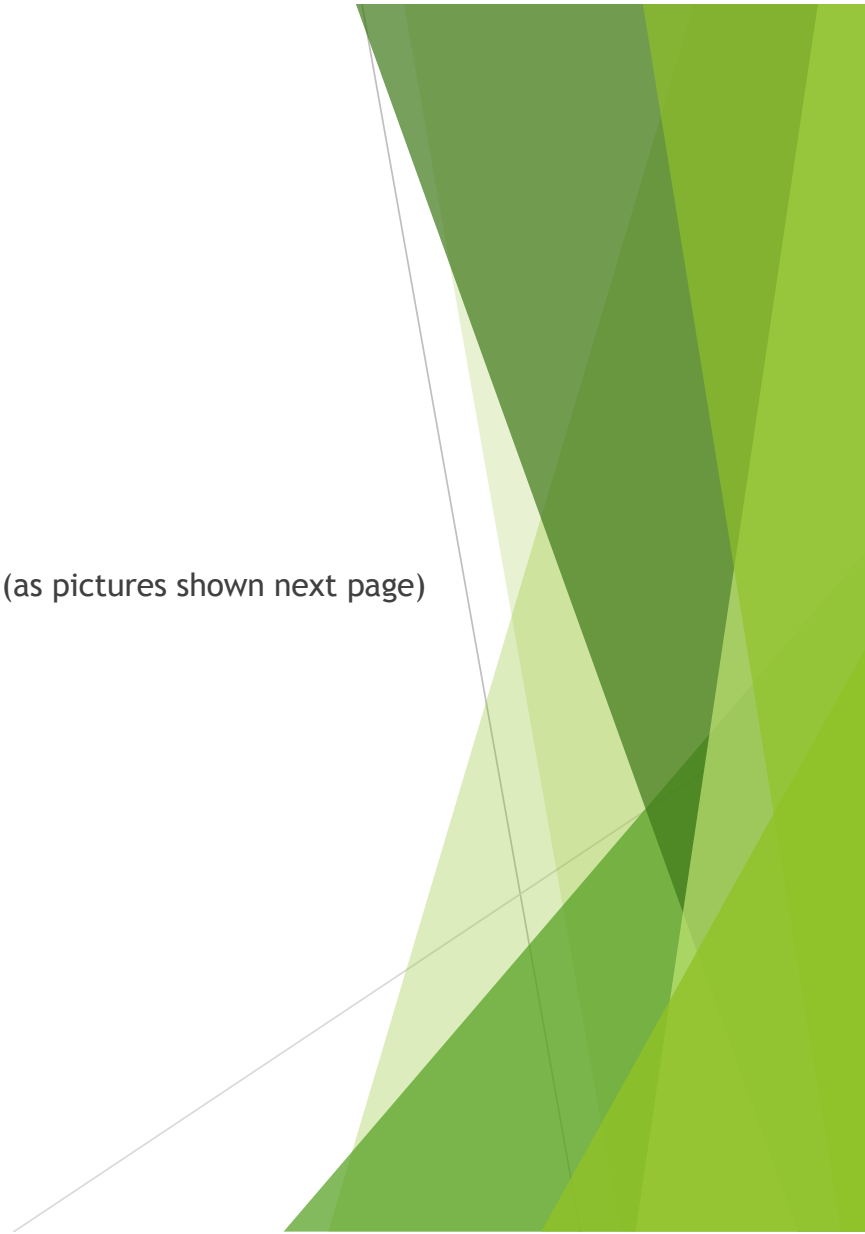
The background features abstract green geometric shapes. On the left, a thin, elongated green triangle points downwards. On the right, a complex arrangement of overlapping green triangles in various shades (from light lime to dark forest green) forms a larger, more intricate shape. A thin, light gray line extends from the bottom left towards the right, passing through the green shapes.

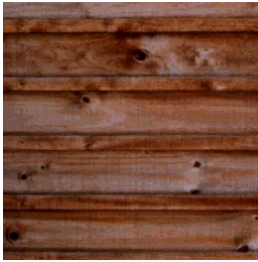
# Lab 11

## Texture

# Render a cube with textures

- ▶ Load images with OpenCV.
- ▶ An example code and images are provided
  - ▶ This example program renders a cube and a plane with textures (as pictures shown next page)
  - ▶ You can ignore the plane (comment out the codes of planes)
- ▶ Re-write the program, load the image with OpenCV instead.





```

cv::Mat image = cv::imread("textures/trashbin.png");
//cv::Mat flipped;
//cv::flip(image, flipped, 0);
//image = flipped;
if(image.empty()){
    std::cout << "image empty" << std::endl;
}else{
    cv::flip(image, image, 0);
    glGenTextures(1, &textureTrash);
    glBindTexture(GL_TEXTURE_2D, textureTrash);

    glTexParameteri(GL_TEXTURE_2D, GL_TEXTURE_MIN_FILTER, GL_NEAREST);
    glTexParameteri(GL_TEXTURE_2D, GL_TEXTURE_MAG_FILTER, GL_LINEAR);

    // Set texture clamping method
    glTexParameteri(GL_TEXTURE_2D, GL_TEXTURE_WRAP_S, GL_CLAMP);
    glTexParameteri(GL_TEXTURE_2D, GL_TEXTURE_WRAP_T, GL_CLAMP);

    glTexImage2D(GL_TEXTURE_2D,      // Type of texture
                0,                  // Pyramid level (for mip-mapping) - 0 is t
                GL_RGB,             // Internal colour format to convert to
                image.cols,         // Image width i.e. 640 for Kinect in st
                image.rows,         // Image height i.e. 480 for Kinect in st
                0,                  // Border width in pixels (can either be 1
                GL_BGR,             // Input image format (i.e. GL_RGB, GL_RGBA, GL_BGR et
                GL_UNSIGNED_BYTE,    // Image data type
                image.ptr());        // The actual image data itself

    glGenerateMipmap(GL_TEXTURE_2D);
}

```

Read image  
using OpenCV  
example

<https://stackoverflow.com/questions/16809833/opencv-image-loading-for-opengl-texture>