

# Quick guide to the 3DViewer v2.0

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February 2024

# 1 Introduction

The 3DViewer v1.0 is a program to view 3D wireframe models. This program is implemented by the C programming language using structured programming. The GUI is implemented using the Qt library. The models themselves can be loaded from .obj files and be viewable on the screen with the ability to rotate, scale and translate.

A wireframe model is a model of an object in 3D graphics, which is a set of vertices and edges that defines the shape of the displayed polyhedral object in three-dimensional space.

.Obj file is a geometry definition file format first developed by Wavefront Technologies. The file format is open and accepted by many 3D graphics application vendors.

# 2 Features

The following features are supported:

- The program is developed in C language of C11 standard using gcc compiler by using additional QT libraries and modules
- The program is developed according to the principles of structured programming
- Prepared full coverage of modules related to model loading and affine transformations with unit-tests
- Only one model is on the screen at a time
- The program provides the ability to:
  - Load a wireframe model from an obj file (vertices and surfaces list support only).
  - Translate the model by a given distance in relation to the X, Y, Z axes.
  - Rotate the model by a given angle relative to its X, Y, Z axes.
  - Scale the model by a given value.
- GUI implementation, based QT library with API for C11
- The graphical user interface contains:
  - A button to select the model file and a field to output its name.
  - A visualisation area for the wireframe model.
  - Button/buttons and input fields for translating the model.
  - Button/buttons and input fields for rotating the model.
  - Button/buttons and input fields for scaling the model.
  - Information about the uploaded model - file name, number of vertices and edges.
- The program correctly processes and allows user to view models with details up to 100, 1000, 10,000, 100,000, 1,000,000 vertices without freezing (a freeze is an interface inactivity of more than 0.5 seconds)

### 3 Bonus. Settings

The 3DViewer v1.0 provides a special settings features:

- The program allows customizing the type of projection (parallel and central)
- The program allows setting up the type (solid, dashed), color and thickness of the edges, display method (none, circle, square), color and size of the vertices
- The program allows choosing the background color
- Settings are saved between program restarts

### 4 Bonus. Record

The 3DViewer v1.0 provides a special record features:

- The program allows saving the captured (rendered) images as bmp and jpeg files.
- The program allows recording small screencasts by a special button - the current custom affine transformation of the loaded object into gif-animation (640x480, 10fps, 5s)