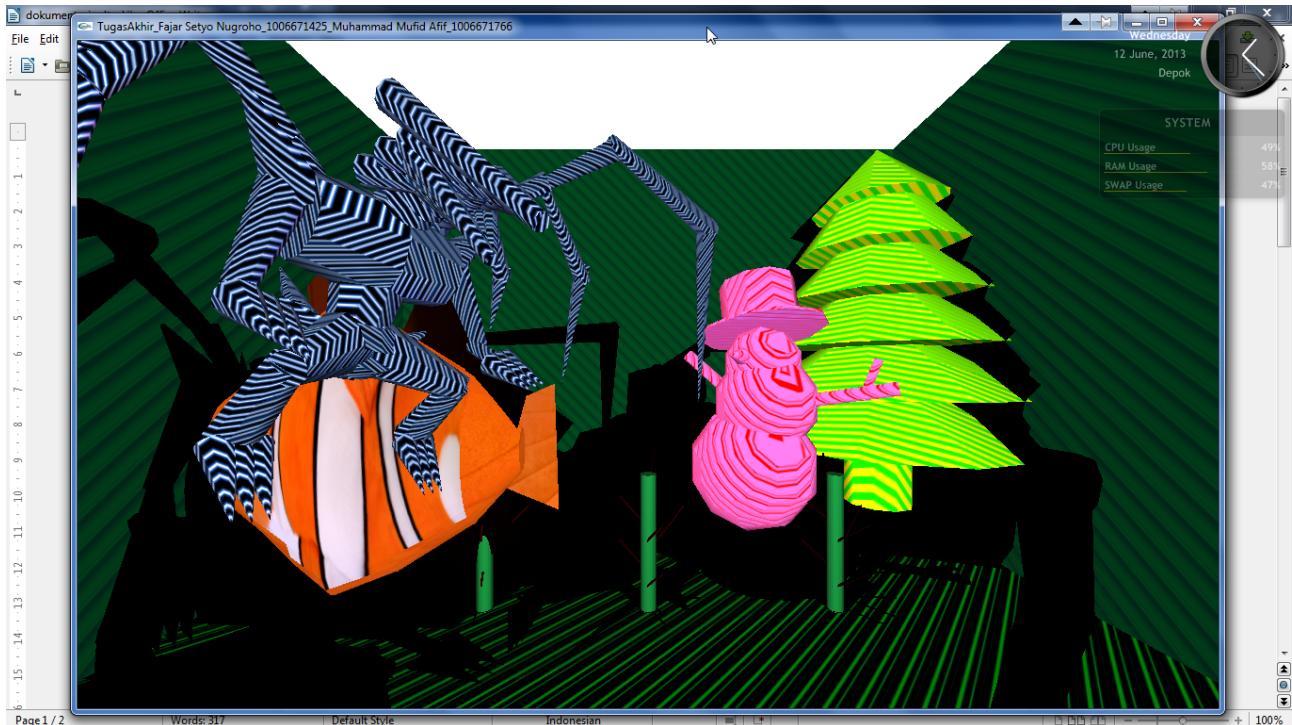


Petunjuk Penggunaan dan Dokumentasi Tugas Akhir



Tugas Akhir Grafika Komputer

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Kompilasi dan Menjalankan

Kompilasi dilakukan dengan membuka file *.sln yang ada di *root folder* dari listing program ini. Harus dibuka di dalam Visual Studio 2012 karena ada rutin prakompilasi khusus terkait loading berkas obj dan mtl (hasil ekspor dari Blender).

Untuk menjalankan dan mencoba interaktivitasnya bisa menggunakan klik kiri dan klik kanan., Untuk memilih bagian mana yang mau dibuat interaktif bisa menggunakan klik tengah. Sekaligus konteks menu klik tengah juga memiliki opsi-opsi lain terkait dengan tugas ini.

Pembentukan Objek

Ada dua objek jenis objek yang dibuat, yaitu dari Blender dan dari penulisan kode secara manual dengan API dari glut. Objek yang dibuat dari Blender murni buatan Mufid dan Fajar (adapun tekstur diambil dari objek yang bersesuaian).

Berkas asli Blender terlampir dalam tugas ini.

Untuk loading objek dengan Blender, digunakan kepastakaan glm.h dan libpng untuk memuat teksturnya. Adapun kodenya adalah sebagai berikut:

```
GLMmodel* kaktus;  
  
kaktus = (GLMmodel*)malloc(sizeof(GLMmodel));
```

```

    kaktus = glmReadOBJ("kaktus.obj");

    glEnable(GL_TEXTURE);
    glEnable(GL_TEXTURE_2D);
    //Persiapan untuk menggambar beserta teksturnya
    kaktus_dp = glGenLists(1);
    glNewList(kaktus_dp, GL_COMPILE);
    glmDraw(kaktus, GLM_SMOOTH | GLM_MATERIAL | GLM_COLOR);
    glEndList();

```

Pada kode manual, digunakan API dari glut. Misalnya membuat kaki:

```

    glTranslatef(-2.8, -1.2, 2.3);
    glRotatef(jointDegree[7], 1.0, 0.0, 0.0);
    glPushMatrix();
    glRotatef(140.0, 1.0, 0.0, 0.0);
    SOLID_CLOSED_CYLINDER(1leg, CALF_LOWER, CALF_UPPER, CALF_HEIGHT, 10, 10);
    glRotatef(-140.0, 1.0, 0.0, 0.0);
    glTranslatef(0.0, -3.3, -2.7);
    glRotatef(30.0, 1.0, 0.0, 0.0);
    glScalef(FEET_WIDTH, FEET_HEIGHT, FEET_LENGTH);
    glScalef(1.0/FEET_WIDTH, 1.0/FEET_HEIGHT, 1.0/FEET_LENGTH);
    glRotatef(30.0, -1.0, 0.0, 0.0);
    glTranslatef(0.0, 0.0, 1.0);
    glTranslatef(0.5, -1.85, 0.8);
    for(int ii = 0; ii < 3; ++ii) {
        glRotatef(-130, 1.0, 0.0, 0.0);
        SOLID_CLOSED_CYLINDER(neck, 0.01, MAX_WING, 3.0, 10, 10);
        glRotatef(130, 1.0, 0.0, 0.0);
        glTranslatef(-0.5, 0, .0);
    }
    glPopMatrix();

```

Rendering Objek dan Scene

Rendering dilakukan dengan

Fasilitas API GLUT yang Digunakan

Ditambah dengan ekstensi dari GLM dan libpng. Selain itu:

```

glBegin
glBindTexture
glClear
glClearColor
glColor3f
glDeleteTextures
glDepthFunc
glDisable
glEnable
glEnd
glFlush
glGenTextures
glGetFloatv
glLightfv
glLoadIdentity
glMaterialf
glMaterialfv
glMatrixMode

```

glPolygonMode
glPopMatrix
glPushMatrix
glRotatef
glScalef
glShadowProjection
glTexEnvf
glTexGenfv
glTexGeni
glTexParameterf
glTranslatef
glVertex3f
glViewport
gluBuild2DMipmaps
gluCylinder
gluDisk
gluLookAt
gluLookAt;
gluNewQuadric
gluPerspective
gluQuadricDrawStyle
gluSphere
glutAddMenuEntry
glutAddSubMenu
glutAttachMenu
glutCreateMenu
glutCreateWindow
glutDisplayFunc
glutIdleFunc
glutInit
glutInitDisplayMode
glutInitWindowSize
glutKeyboardFunc
glutMainLoop
glutMouseFunc
glutPostRedisplay
glutReshapeFunc
glutSolidSphere
glutSwapBuffers
glutTimerFunc

Algoritma Pembuatan Objek

Untuk pembuatan objek selain bayangan sudah dijelaskan pada paragraf di atas

Untuk pembuatan algoritma bayangan kami membuat dari sumber berikut:

<http://stackoverflow.com/questions/8667108/opengl-es-1-x-add-shadow>

```
static inline void glShadowProjection(float * l, float * e, float * n)
{
    float d, c;
    float mat[16];
```

```

// These are c and d (corresponding to the tutorial)

d = n[0]*l[0] + n[1]*l[1] + n[2]*l[2];
c = e[0]*n[0] + e[1]*n[1] + e[2]*n[2] - d;

// Create the matrix. OpenGL uses column by column
// ordering

mat[0]  = l[0]*n[0]+c;
mat[4]  = n[1]*l[0];
mat[8]  = n[2]*l[0];
mat[12] = -l[0]*c-l[0]*d;

mat[1]  = n[0]*l[1];
mat[5]  = l[1]*n[1]+c;
mat[9]  = n[2]*l[1];
mat[13] = -l[1]*c-l[1]*d;

mat[2]  = n[0]*l[2];
mat[6]  = n[1]*l[2];
mat[10] = l[2]*n[2]+c;
mat[14] = -l[2]*c-l[2]*d;

mat[3]  = n[0];
mat[7]  = n[1];
mat[11] = n[2];
mat[15] = -d;

// Finally multiply the matrices together *plonk*
glmMultMatrixf(mat);
}

```

Referensi

Kami menggunakan kepastakan GLM.h dari dua versi yang kami sandingkan bersama:

- <https://github.com/windelicato/Asteroids/tree/master/src>
- libbot.googlecode.com

Log Pekerjaan

Bagian Fajar:

- Kamera keseluruhan
- Shadow dan Lighting
- Pembuatan Objek naga, cemara, orang-orangan salju, dan tembok
- Texturing obejek naga, cemara, orang-orangan salju

Bagian Mufid:

- Kamera dan animasi Nemo
- Shadow
- Objek Nemo dan kaktus

- Texturing nemo

Kami menggunakan git sebagai pembantu source control kami. Berikut log dari git kami: (Log diambil pada hari Rabu, 12 Juni 2013.

```
$ git log
```

```
[7c3e89a] Mufid Afif 47 minutes ago: FINAL: Kamera nemo beres. Animasi nemo beres
Tes/1006671425-1006671766.cpp | 71 ++++++-----
Tes/model/zudomon.cpp         | 70 ++++++-----
Tes/model/zudomon.h           | 11 ++-----
3 files changed, 98 insertions(+), 54 deletions(-)
```

```
[8116bfb] Mufid Afif 3 hours ago: FIXED: Nemo sekarang sudah bisa dyncamera
Tes/1006671425-1006671766.cpp | 31 ++++++-----
Tes/model/zudomon.cpp         | 64 ++++++-----
Tes/model/zudomon.h           | 15 ++++++
Tes/nemo-belakang.obj         | 12 ++++----
4 files changed, 103 insertions(+), 19 deletions(-)
```

```
[21efcc0] Mufid Afif 8 hours ago: MILESTONE DONE: WIREFRAME MODE
Tes/1006671425-1006671766.cpp | 29 ++++++-----
1 file changed, 28 insertions(+), 1 deletion(-)
```

```
[1e12ae8] Mufid Afif 15 hours ago: Mbenerin Nemo. 50%. Texturing + Animasi beres,
tinggal tambah beberapa rigid body yang lain
Tes/model/zudomon.cpp | 29 ++++++-----
Tes/nemo-sirip.mtl     | 10 +-----
Tes/nemo-sirip.obj     | 34 ++++++-----
3 files changed, 38 insertions(+), 35 deletions(-)
```

```
[f18b039] Mufid Afif 18 hours ago: Mendeteksi baris kode yang merubah segalanya
huahuahua
Tes/1006671425-1006671766.cpp | 6 +++--
Tes/init.cpp                  | 19 +++++-----
Tes/model/zudomon.cpp         | 3 ---
3 files changed, 8 insertions(+), 20 deletions(-)
```

```
[251d0ea] Mufid Afif 18 hours ago: FIXED: KAKTUS BERES
Tes/1006671425-1006671766.cpp | 43 ++++++-----
1 file changed, 21 insertions(+), 22 deletions(-)
```

```
[c01e3a4] Mufid Afif 19 hours ago: minor bug size ATi
Tes/1006671425-1006671766.cpp | 6 +++--
1 file changed, 3 insertions(+), 3 deletions(-)
```

```
[72a9435] Mufid Afif 19 hours ago: Staging: persiapan loading obj
Tes/1006671425-1006671766.cpp | 27 +++++-----
Tes/init.cpp                  | 108 ++++++-----
Tes/init.h                   | 4 +-
Tes/model/zudomon.cpp         | 17 +++----
Tes/model/zudomon.h           | 4 +-
5 files changed, 97 insertions(+), 63 deletions(-)
```

```
[1982849] Mufid Afif 23 hours ago: Perbaiki kompilasi di mufid. Obj shadow belum jadi
Tes/1006671425-1006671766.cpp | 10 +++++-----
Tes/camera.cpp                 | 1 +
Tes/init.cpp                   | 21 +++++-----
Tes/init.h                     | 7 +++++--
Tes/model/zudomon.cpp          | 12 ++++++---
Tes/model/zudomon.h            | 4 ++--
6 files changed, 29 insertions(+), 26 deletions(-)
```

```
[9a61fee] Fajar Nugroho 27 hours ago: [major] camera, texture, shadow, 90%
```

```

Tes/1006671425-1006671766.cpp | 639 ++++++-----
Tes/GLAux.h | 373 ++++++
Tes/Tes.vcxproj | 2 +
Tes/Tes.vcxproj.filters | 6 +
Tes/bloody_violet.raw | Bin 0 -> 1080000 bytes
Tes/camera.cpp | 167 ++++++
Tes/camera.h | 52 ++++
Tes/dark_blue.raw | Bin 0 -> 1080000 bytes
Tes/green_floor.raw | Bin 0 -> 1080000 bytes
Tes/orange.raw | Bin 1080000 -> 0 bytes
Tes/sunset_wall.raw | 1 +
Tes/yellow_dot.raw | Bin 0 -> 1080000 bytes
12 files changed, 1065 insertions(+), 175 deletions(-)

```

[3da14da] Fajar Nugroho 7 days ago: STAGING: sementara shadow masih rusak

```

Tes/1006671425-1006671766.cpp | 16 ++++++----
Tes/init.h | 2 +-
2 files changed, 13 insertions(+), 5 deletions(-)

```

[2617573] Mufid Afif 7 days ago: obj lupa

```

Tes/f-16.obj | 9697 ++++++
Tes/kubus-tes.obj | 33 +
Tes/nemo-belakang.obj | 17 +
Tes/nemo-bodi.obj | 1347 ++++++
Tes/nemo-sirip.obj | 36 +
Tes/nemo.obj | 1413 ++++++
Tes/soccerball.obj | 7144 ++++++
7 files changed, 19687 insertions(+)

```

[e57e665] Mufid Afif 7 days ago: bunch of renaming, mbenerin

```

Tes/1006671425-1006671766.cpp | 2 +-
Tes/glm/glm.c | 255 ++++++-----
Tes/glm/glm.h | 1 +
Tes/glm/glm_util.c | 90 ++++++----
Tes/glm/glmimg.c | 340 ++++++-----
Tes/glm/glmimg_png.c | 353 ++++++-----
6 files changed, 530 insertions(+), 511 deletions(-)

```

[11fdca7] Mufid Afif 7 days ago: bersih bersih

[c0a7e5a] Mufid Afif 7 days ago: satuin

[16ad86c] Mufid Afif 7 days ago: bunch of changes

```

Tes/1006671425-1006671766.cpp | 40 +----
Tes/Tes.vcxproj.filters | 6 +-
Tes/f-16.mtl | 41 +++++
Tes/glm/glm.c | 255 ++++++-----
Tes/glm/glm.h | 4 +-
Tes/glm/glm_util.c | 91 ++++++----
Tes/glm/glmimg.c | 349 ++++++-----
Tes/glm/glmimg_devil.c | 47 +++++
Tes/glm/glmimg_jpg.c | 357 ++++++-----
Tes/glm/glmimg_png.c | 356 ++++++-----
Tes/glm/glmimg_sdl.c | 96 ++++++
Tes/glm/glmimg_sim.c | 32 +++++
Tes/init.cpp | 101 ++++++
Tes/init.h | 20 +++
Tes/kubus-tes.mtl | 12 ++
Tes/libpng/gzio.c | 4 +-
Tes/libpng/pngread.c | 4 +-
Tes/libpng/pngtest.c | 2 +-
Tes/libpng/pngwrite.c | 3 +-
Tes/libpng/zconf.h | 2 +-
Tes/model/zudomon.cpp | 15 +-
Tes/model/zudomon.h | 3 +
Tes/nemo-belakang.mtl | 12 ++

```

Tes/nemo-bodi.mtl	12 ++
Tes/nemo-keren.blend	Bin 0 -> 567080 bytes
Tes/nemo-sirip.mtl	20 +++
Tes/nemo.mtl	20 +++
Tes/soccerball.mtl	13 ++
Tes/textures/BOOK_PAG.jpg	Bin 0 -> 3334 bytes
Tes/textures/CAMARO.jpg	Bin 0 -> 5694 bytes
Tes/textures/CEMENT.jpg	Bin 0 -> 1939 bytes
Tes/textures/Cripefus.jpg	Bin 0 -> 19986 bytes
Tes/textures/EWALNUT.jpg	Bin 0 -> 7299 bytes
Tes/textures/GP_side_diff.jpg	Bin 0 -> 31429 bytes
Tes/textures/GRANITFC.jpg	Bin 0 -> 30863 bytes
Tes/textures/INDIROSE.jpg	Bin 0 -> 6955 bytes
Tes/textures/IPAVERS.jpg	Bin 0 -> 1343 bytes
Tes/textures/MAHOGANY.jpg	Bin 0 -> 10734 bytes
Tes/textures/MARBPAL.jpg	Bin 0 -> 8706 bytes
Tes/textures/SAND.jpg	Bin 0 -> 3476 bytes
Tes/textures/Texture_Loralou4.jpg	Bin 0 -> 14052 bytes
Tes/textures/WALNUT1.jpg	Bin 0 -> 10027 bytes
Tes/textures/center0.jpg	Bin 0 -> 83471 bytes
Tes/textures/center1.jpg	Bin 0 -> 93963 bytes
Tes/textures/center10.jpg	Bin 0 -> 91813 bytes
Tes/textures/center11.jpg	Bin 0 -> 98969 bytes
Tes/textures/center12.jpg	Bin 0 -> 88053 bytes
Tes/textures/center13.jpg	Bin 0 -> 97215 bytes
Tes/textures/center14.jpg	Bin 0 -> 95704 bytes
Tes/textures/center15.jpg	Bin 0 -> 90219 bytes
Tes/textures/center16.jpg	Bin 0 -> 72380 bytes
Tes/textures/center17.jpg	Bin 0 -> 75513 bytes
Tes/textures/center18.jpg	Bin 0 -> 79662 bytes
Tes/textures/center19.jpg	Bin 0 -> 71259 bytes
Tes/textures/center2.jpg	Bin 0 -> 91355 bytes
Tes/textures/center20.jpg	Bin 0 -> 61795 bytes
Tes/textures/center21.jpg	Bin 0 -> 16847 bytes
Tes/textures/center22.jpg	Bin 0 -> 69741 bytes
Tes/textures/center23.jpg	Bin 0 -> 90443 bytes
Tes/textures/center24.jpg	Bin 0 -> 22708 bytes
Tes/textures/center25.jpg	Bin 0 -> 20819 bytes
Tes/textures/center26.jpg	Bin 0 -> 95995 bytes
Tes/textures/center27.jpg	Bin 0 -> 88149 bytes
Tes/textures/center28.jpg	Bin 0 -> 24740 bytes
Tes/textures/center29.jpg	Bin 0 -> 23796 bytes
Tes/textures/center3.jpg	Bin 0 -> 86803 bytes
Tes/textures/center4.jpg	Bin 0 -> 93399 bytes
Tes/textures/center5.jpg	Bin 0 -> 95183 bytes
Tes/textures/center6.jpg	Bin 0 -> 91984 bytes
Tes/textures/center7.jpg	Bin 0 -> 90503 bytes
Tes/textures/center8.jpg	Bin 0 -> 99155 bytes
Tes/textures/center9.jpg	Bin 0 -> 102502 bytes
Tes/textures/checker.jpg	Bin 0 -> 1781 bytes
Tes/textures/cripeelv.jpg	Bin 0 -> 1706 bytes
Tes/textures/criperud.jpg	Bin 0 -> 2377 bytes
Tes/textures/cripetai.jpg	Bin 0 -> 2560 bytes
Tes/textures/cripewng.jpg	Bin 0 -> 16392 bytes
Tes/textures/earth2.jpg	Bin 0 -> 257089 bytes
Tes/textures/eflogo.jpg	Bin 0 -> 6343 bytes
Tes/textures/fishermen.jpg	Bin 0 -> 2599 bytes
Tes/textures/g5ailed6823.jpg	Bin 0 -> 8635 bytes
Tes/textures/g5aileg67c9.jpg	Bin 0 -> 9097 bytes
Tes/textures/g5aileg67c9.ppm.orig	8 +
Tes/textures/g5ailelo67a1.jpg	Bin 0 -> 2805 bytes
Tes/textures/g5dernos673d.jpg	Bin 0 -> 1917 bytes
Tes/textures/g5empd6887.jpg	Bin 0 -> 956 bytes
Tes/textures/g5empg65e8.jpg	Bin 0 -> 1049 bytes

```

Tes/textures/g5fused68cd.jpg | Bin 0 -> 16466 bytes
Tes/textures/g5fused65fc.jpg | Bin 0 -> 16737 bytes
Tes/textures/hanger.jpg | Bin 0 -> 22647 bytes
Tes/textures/hellskull_tex.jpg | Bin 0 -> 53079 bytes
Tes/textures/hurt0.jpg | Bin 0 -> 28258 bytes
Tes/textures/hurt_39_fix.jpg | Bin 0 -> 24062 bytes
Tes/textures/jar_fix.jpg | Bin 0 -> 28108 bytes
Tes/textures/lady_c.jpg | Bin 0 -> 61222 bytes
Tes/textures/nameplate_agam.jpg
| Bin 0 -> 10212 bytes
Tes/textures/nemo-asli.png | Bin 0 -> 3218610 bytes
Tes/textures/side_lowA.jpg | Bin 0 -> 10578 bytes
Tes/textures/side_panel.jpg | Bin 0 -> 3178 bytes
Tes/textures/side_top.jpg | Bin 0 -> 4240 bytes
100 files changed, 1160 insertions(+), 765 deletions(-)

```

[12139be] Fajar Nugroho 7 days ago: sebelum bernaung

```

Tes/1006671425-1006671766.cpp | 13 ++++++++
Tes/init.cpp | 36 +++++
Tes/init.h | 1 +
3 files changed, 49 insertions(+), 1 deletion(-)

```

[8568b49] Fajar Nugroho 7 days ago: [dragon] animation 90%, change texture

```

Tes/1006671425-1006671766.cpp | 72 +++++
Tes/orange.raw | Bin 1080000 -> 1080000 bytes
2 files changed, 60 insertions(+), 12 deletions(-)

```

[504e56f] Fajar Nugroho 7 days ago: [major] texture dragon success, snowman, pine

```

Tes/1006671425-1006671766.cpp | 256 +++++
Tes/orange.raw | Bin 0 -> 1080000 bytes
2 files changed, 236 insertions(+), 20 deletions(-)

```

[4c8c005] Mufid Afif 7 days ago: kaktus

```

Tes/1006671425-1006671766.cpp | 4 +-
Tes/Extensions/ARB_multitexture_extension.cpp | 1 -
.../EXT_texture_env_combine_extension.cpp | 3 +-
Tes/GLee/GLee.h | 2 +-
Tes/Tes.vcxproj | 65 +-
Tes/Tes.vcxproj.filters | 183 +-
Tes/glsl.h | 2 +-
Tes/glm/CMakeLists.txt | 26 +
Tes/glm/batch_gl.c | 219 +
Tes/glm/batch_gl.h | 93 +
Tes/glm/bot_vis.h | 43 +
Tes/glm/console.c | 241 +
Tes/glm/console.h | 78 +
Tes/glm/default_view_handler.c | 609 +++
Tes/glm/default_view_handler.h | 75 +
Tes/glm/fbgl_drawing_area.c | 222 +
Tes/glm/fbgl_drawing_area.h | 58 +
Tes/glm/gl_drawing_area.c | 437 ++
Tes/glm/gl_drawing_area.h | 56 +
Tes/glm/gl_image_area.c | 285 ++
Tes/glm/gl_image_area.h | 73 +
Tes/glm/gl_util.c | 704 +++
Tes/glm/gl_util.h | 178 +
Tes/glm/glm.c | 2249 +++++
Tes/glm/glm.h | 318 ++
Tes/glm/glm_util.c | 146 +
Tes/glm/glmimg.c | 397 ++
Tes/glm/glmimg.jpg.c | 239 +
Tes/glm/glmimg.png.c | 225 +
Tes/glm/glmint.h | 45 +
Tes/glm/gtk_util.c | 157 +

```


Tes/glm/gtk_util.h	40 +
Tes/glm/param_widget.c	1044 ++++
Tes/glm/param_widget.h	137 +
Tes/glm/rwx.c	583 +++
Tes/glm/rwx.h	72 +
Tes/glm/scrollplot2d.c	509 ++
Tes/glm/scrollplot2d.h	179 +
Tes/glm/stock_renderer_grid.c	228 +
Tes/glm/texture.c	299 ++
Tes/glm/texture.h	131 +
Tes/glm/tokenize.c	310 ++
Tes/glm/tokenize.h	42 +
Tes/glm/view.c	338 ++
Tes/glm/view.h	73 +
Tes/glm/viewer.c	1719 ++++++
Tes/glm/viewer.h	506 ++
Tes/glm/wavefront.c	117 +
Tes/glm/wavefront.h	93 +
Tes/libpng/adler32.c	149 +
Tes/libpng/compress.c	79 +
Tes/libpng/crc32.c	423 ++
Tes/libpng/crc32.h	441 ++
Tes/libpng/deflate.c	1736 ++++++
Tes/libpng/deflate.h	331 ++
Tes/libpng/gzio.c	1028 ++++
Tes/libpng/infback.c	623 +++
Tes/libpng/inffast.c	318 ++
Tes/libpng/inffast.h	11 +
Tes/libpng/inffixed.h	94 +
Tes/libpng/inflate.c	1368 ++++++
Tes/libpng/inflate.h	115 +
Tes/libpng/inftrees.c	329 ++
Tes/libpng/inftrees.h	55 +
Tes/libpng/minigzip.c	324 ++
Tes/libpng/png.c	4298 ++++++
Tes/libpng/png.h	3304 ++++++
Tes/libpng/pngconf.h	616 +++
Tes/libpng/pngdebug.h	157 +
Tes/libpng/pngerror.c	932 ++++
Tes/libpng/pngget.c	1177 +++++
Tes/libpng/pnginfo.h	260 +
Tes/libpng/pnglibconf.h	211 +
Tes/libpng/pngmem.c	277 ++
Tes/libpng/pngpread.c	1291 +++++
Tes/libpng/pngpriv.h	1913 ++++++
Tes/libpng/pngread.c	4000 ++++++
Tes/libpng/pngrio.c	118 +
Tes/libpng/pngrtran.c	5101 ++++++
Tes/libpng/pngrutil.c	4462 ++++++
Tes/libpng/pngset.c	1606 +++++
Tes/libpng/pngstruct.h	489 ++
Tes/libpng/pngtest.c	1971 ++++++
Tes/libpng/pngtrans.c	841 ++++
Tes/libpng/pngwio.c	164 +
Tes/libpng/pngwrite.c	2332 ++++++
Tes/libpng/pngwtran.c	637 +++
Tes/libpng/pngwutil.c	3023 ++++++
Tes/libpng/trees.c	1219 +++++
Tes/libpng/trees.h	128 +
Tes/libpng/uncompr.c	61 +
Tes/libpng/zconf.h	332 ++
Tes/libpng/zconf.in.h	332 ++
Tes/libpng/zlib.h	1357 +++++
Tes/libpng/zutil.c	318 ++

```

Tes/libpng/zutil.h | 269 ++
Tes/model/zudomon.cpp | 16 +
Tes/model/zudomon.h | 2 +
Tes/wglext.h | 2 +-
99 files changed, 64461 insertions(+), 32 deletions(-)

[ccc4721] Mufid Afif 7 days ago: staging: udah ada kaktus yee
Tes/1006671425-1006671766.cpp | 49 +-
Tes/kaktus.obj | 1629 ++++++
Tes/sayap.obj | 44 ++
3 files changed, 1707 insertions(+), 15 deletions(-)

[df03933] Fajar Nugroho 8 days ago: [merge] success
Tes/1006671425-1006671766.cpp | 2 ++
Worksheet3.v11.suo | Bin 17408 -> 0 bytes
2 files changed, 2 insertions(+)

[ff00c30] Mufid Afif 8 days ago: masteee, jangan lagi
[54452f5] Mufid Afif 8 days ago: Coba nambahin kaktus (warning: masih gak jalan
Tes/1006671425-1006671766.cpp | 23 ++++++
1 file changed, 22 insertions(+), 1 deletion(-)

[845ae6a] Fajar Nugroho 8 days ago: [dragon] object 90%
Tes/1006671425-1006671766.cpp | 434 ++++++-----
Worksheet3.v11.suo | Bin 3584 -> 17408 bytes
ipch/tes-233d721d/worksheet3-a80f3c7b.ipch | Bin 0 -> 2555904 bytes
3 files changed, 254 insertions(+), 180 deletions(-)

[31a826b] Mufid Afif 9 days ago: OK. READY FOR DUTY
.gitignore | 3 +-
Tes/1006671425-1006671766.cpp | 450 ++++++-----
Tes/Tes.vcxproj | 3 +-
3 files changed, 342 insertions(+), 114 deletions(-)

[9a7a9c2] Fajar Nugroho 9 days ago: [init] pertamaxxxxxxxxxxxxxx
Tes/1006671425-1006671766.cpp | 513 ++++++-----
Tes/glut32.lib | Bin 0 -> 28728 bytes
Worksheet3.v11.suo | Bin 0 -> 3584 bytes
3 files changed, 173 insertions(+), 340 deletions(-)

[6583045] Mufid Afif 9 days ago: Pertama kali
.gitignore | 4 +
BACA-AKU.txt | 10 +
Tes/.gitignore | 2 +
Tes/1006671425-1006671766.cpp | 802 ++
Tes/Extensions/ARB_multitexture_extension.cpp | 143 +
Tes/Extensions/ARB_multitexture_extension.h | 54 +
.../EXT_texture_env_combine_extension.cpp | 38 +
Tes/Extensions/EXT_texture_env_combine_extension.h | 18 +
Tes/GLee/GLee.c | 10615 ++++++
Tes/GLee/GLee.h | 10072 ++++++
Tes/GLee/extensionList.txt | 353 +
Tes/GLee/readme.txt | 334 +
Tes/Maths/COLOR.cpp | 58 +

Tes/Maths/COLOR.h | 134 +
Tes/Maths/MATRIX4X4.cpp | 772 ++
Tes/Maths/MATRIX4X4.h | 132 +
Tes/Maths/Maths.h | 30 +
Tes/Maths/PLANE.cpp | 85 +
Tes/Maths/PLANE.h | 68 +
Tes/Maths/VECTOR2D.cpp | 51 +
Tes/Maths/VECTOR2D.h | 115 +
Tes/Maths/VECTOR3D.cpp | 158 +

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Tes/Maths/VECTOR3D.h		160 +
Tes/Maths/VECTOR4D.cpp		94 +
Tes/Maths/VECTOR4D.h		137 +
Tes/ReadMe.txt		40 +
Tes/Tes.vcxproj		134 +
Tes/Tes.vcxproj.filters		115 +
Tes/glext.h		13140 ++++++
Tes/glm.cpp		1838 +++
Tes/glm.h		261 +
Tes/inc/glut.def		126 +
Tes/inc/glut.h		716 +
Tes/sayap.mtl		10 +
Tes/stdafx.cpp		8 +
Tes/stdafx.h		13 +
Tes/targetver.h		8 +
Tes/wglext.h		943 ++
Worksheet3.sln		20 +
39 files changed, 41811 insertions(+)		

end.