

Copyright (c) 2001-2003 DTECTA

User's Guide

to the SOLID Collision Detection Library

last updated 28 December 2003
for version 3.5

1 License

This open-source edition of SOLID version 3 is released under the terms of either the

2 Introduction

SOLID is a software library containing functions for performing intersection tests and proximity queries that are useful in the context of collision detection. Collision detection is the process of detecting pairs of geometric objects that are intersecting or are within

2. The broad phase: A set of C++

•

4 The SOLID API

A stride of zero denotes that the vertex coordinate data is packed in a separate array, thus

```
DT_Vector3 verts[NUM_VERTICES];
```

```
DT_VertexBaseHandle base = DT_NewVertexBase(verts[0], 0);
```

Each time the vertices are updated, or a new vertex base is assigned, to a complex shape, for instance, when using a deformable triangle mesh, the client needs to notify SOLID of a changed vertex array by calling `DT_ChangeVertexBase`. We discuss the use of this command further on.

The placement of an object is changed, either by setting the position, orientation, and scaling, or by using an OpenGL 4x4 column-major matrix representing an affine transformation. Placements are specified relative to the world coordinate system. Rotations are specified using quaternions. The object's local coordinate system can be scaled non-


```
void DT_SetTolerance(DT_Scalar tol_error);
```

This value is the estimated relative rounding error in complex computations and is used for determining whether a floating-point number should be regarded as zero or not. The default value for 'tol_error' is the machine epsilon, which is FLT_EPSILON when floats are used, and DBL_EPSILON

```
void *client_object1,  
void *client_object2,  
const DT_CollData *coll_data);
```

Here, `client_data` is a pointer to an arbitrary structure in the client application, `client_object1` and `client_object2` are the pointers to structures in the client application specified in `DT_CreateObject`, and `l_data` is the response data computed by SOLID. The Boolean value returned by a callback

```
void DT_SetResponseClass(DT_RespTableHandle respTable,  
                        DT_ObjectHandle object,  
                        DT_ResponseClass responseClass);
```

For each pair of objects multiple responses can be defined. A response is a callback together with its response type and client data. The DT_ResponseType-441(e)-1(ac)28(h)-89.5450Td[DT_Respont_ObjectHandlep71.816r780a6-12num D

5 Projects and other things left to do

5.1 Coming Attractions

SOLID 4 will have the following added features:

TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION

which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY

11. BECAUSE THE PROGRAM IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE PROGRAM, TO THE EXTENT PERMITTED BY APPLICABLE LAW. EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE PROGRAM "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE PROGRAM IS WITH YOU. SHOULD THE PROGRAM PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.
12. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE PROGRAM AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PROGRAM (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE PROGRAM TO OPERATE WITH ANY OTHER PROGRAMS), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

END OF TERMS AND CONDITIONS

Appendix B THE Q PUBLIC LICENSE

version 1.0

Copyright © 1999 Troll Tech AS, Norway.
Everyone is permitted to copy and
distribute this license document.

The intent of this license is to establish freedom to share and change the software regulated by this license under the open source model.

This license applies to any software containing a notice placed by the copyright holder

Table of Contents

1	License.....	1
---	--------------	---

Appendix B THE Q PUBLIC LICENSE 31

Granted Rights 31
Limitations of Liability 32