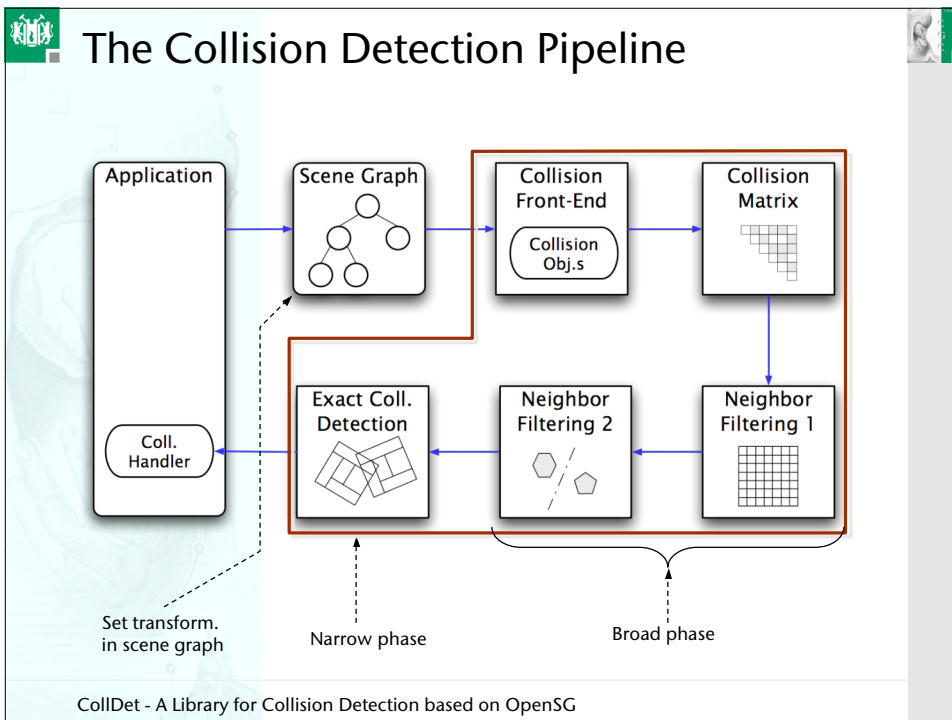# CollDet — A Library for Collision Detection Based on OpenSG

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OpenSG BoF at Siggraph '07, August 2007, San Diego

The Collision Detection Pipeline

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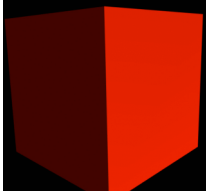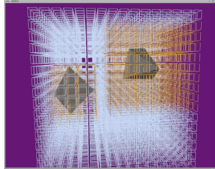
Some Features of our Pipeline

- Two broad-phase tests:
  - Grid
  - Convex hull check
    - Closest feature tracking, w/o i_collide(!)
- For the narrow-phase:
  - Boxtree, or
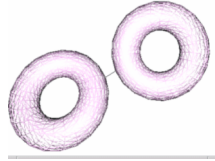 - Dop-Tree

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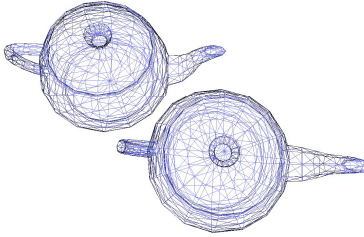- Report one intersecting pair of polygons (the one first found during hierarchy traversal) or all intersecting pairs
- Supports polygon soups
- Multi-threading support
- Easy-to-use interface
- Runs under Linux (makefiles), Mac (makefiles & xcode project), and Windows (M$ project & makefiles)
- User-defined collision callback classes

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Interface

- Initialization

```
// init collision detection
pipeline = new CollisionPipeline( "threadName",
                                  threadID );

// register objects
for ( unsigned int i=0; i < nobjects; i ++ )
{
    pipeline->makeCollidable( object[i].osgnode );
}

// start the collision detection
pipeline->run( threadID );
```

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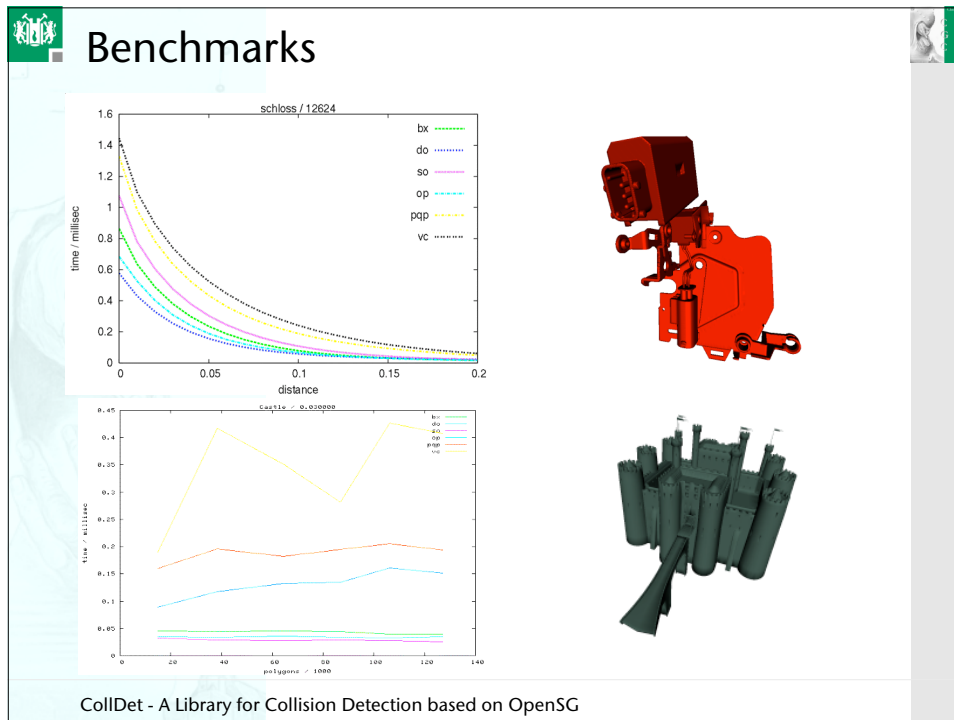
Callbacks

- Define callback class:

```
class CollisionCallback : public col::Callback
{
public:
    virtual void
    operator () ( const col::Data *data ) throw();
};
```

- Register objects:

```
for ( unsigned int i = 0; i < nobjects; i ++ )
  for ( unsigned int j = 0; j < i; j ++ )
  {
    pipeline->addCallback( new CollisionCallback(
                                object[i].osgnode,
                                object[j].osgnode
                                        ) );
  }
```

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Benchmarks

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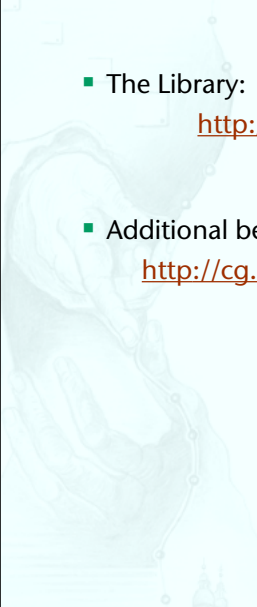# Future Work — What CollDet can't do (yet)

- Penetration depth
- Time critical collision detection
- Continuous collision detection
- Deformable objects
  - Animated objects already working, but not yet integrated

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Additional Information

- The Library:

  http://cg.in.tu-clausthal.de/research/colldet/

- Additional benchmarking results:

  http://cg.in.tu-clausthal.de/research/colldet_benchmark/

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