

MathEngine Toolkits Overview

MathEngine Dynamics Toolkit 2.0 And Collision Toolkit 1.0

The new Dynamics Toolkit 2.0 and Collision Toolkit 1.0 give a set of well- structured components that can be used together as a complete physics engine, or rewired to suit your particular application. The architecture is based on our experience of implementing dynamics systems for engineering applications, virtual reality and computer game development, and on detailed feedback from the game developers who have used our Dynamics Toolkit 1.x in their games - including some of the first PlayStation2 products.

The Collision and Dynamics toolkits are designed to work seamlessly together or can be integrated separately with other software components.

MathEngine Dynamics Toolkit (MEDT) 2.0

The MathEngine Dynamics Toolkit is the next generation of MathEngine's natural behavior technology. Re-engineered to satisfy the rigorous requirements imposed by console development, it delivers a new physics solver, and a series of new modules -- all delivering the speed and stability critical to the world of game development.

At the heart of the Dynamics Toolkit is the Kea Solver, which represents the result of several years development using the latest techniques in rigid-body simulation.

Incorporating advances in numerical method research, Kea's capabilities extend what has previously been considered possible with real-time physics simulation packages.

The Dynamics Toolkit lets developers design and construct real-time simulations efficiently. Built-in stability and easy-to-use interfaces -- with few parameters to set -- make it easy to create a working rigid-body model. Joints, surface contacts and friction are modeled, giving game players a sense of physical reality.

The Dynamics Toolkit has been optimized for x86, Pentium3 and Sony PlayStation2 platforms and is available for SGI Irix, Microsoft Windows, Linux and Sony Playstation2 development environments. It is delivered with source code, allowing for customization and extension.

Dynamics Toolkit 2.0 Benefits

- Articulated Rigid Body Simulation
 - Fast Euler integration for single rigid body simulation
 - Fast semi-implicit integrator for constrained or articulated rigid bodies
 - Multiple joint types: Ball and Socket, Hinge, Fixed Path, Prismatic, Car Wheel, Soft and Hard joint limits
 - Can easily build and edit articulated systems, adding and deleting nodes as required.

- Optimized/Efficient
 - Optimized specifically for x86, Pentium3 and Playstation2. Data layout is carefully structured for efficiency in Windows and PSII memory
- Flexible
 - For maximum performance only code needed is compiled.
- Stable
 - Joints with power-limits enable spring-like simulation, without the instability generated by actual spring simulation
- Easy to Use
 - Source code example programs show MEDT used in a number of typical scenarios
 - Documentation includes both developer guides and online reference

MathEngine Collision Toolkit (MECT) 1.0

The MathEngine Collision Toolkit brings dynamics-friendly collisions to games. It is the first commercial collision detection package to deliver the features of academic packages efficiently in a demanding run-time environment. The MathEngine Collision Toolkit (MECT) provides a robust, efficient set of algorithms designed to deliver fast and accurate run-time collision detection.

Through the use of efficient methods to cull distant objects that are unlikely to make contact, the MECT can optimize speed in calculating collisions between objects. The MECT supports a variety of primitive types used for near field collision detection. Its modular design will also permit developers to implement additional collision types.

The MECT integrates seamlessly with dynamics libraries, allowing for efficient contact generation and collision response.

The MathEngine Collision Toolkit is available for SGI Irix, Microsoft Windows, Linux and Sony PlayStation2 environments.

Collision Toolkit 1.0 Benefits

- Compatible
 - Support for integration with MathEngine Dynamics
 - Support for integration with third-party dynamics APIs
- Fast
 - Collision culling of distant objects reduces computation time.
 - Data layout is carefully structured for efficiency in Windows and PSII memory.
- Full Set of Collision Objects
 - Line Segments

- Planes
- Triangles
- Boxes
- Spheres
- BSP (Binary Space Partioning) trees
- Cylinders
- Cone
- Convex Polyhedra
- Terrain height fields
- Flexible Architecture
 - All primitive collision handling can be replaced with your own routines
 - Custom primitives and collision routines can be added
 - Reduces the memory footprint of the finished product by linking only the essential primitive and collision libraries.

Roadmap

All dates refer to PS2 and PC deliverables. Information for other platforms is available on request.

We are currently in the Beta phase of development of our Dynamics and Collision Toolkits. To contact one of our sales representative, write directly at sales@mathengine.com

If you are already registered in our partner program, you can login to dev.mathengine.com and download the latest release.

- October, 2000

We will release the Beta version of the MEDT and MECT products. If you are interested in being a beta partner, contact one of our sales representatives directly at sales@mathengine.com. Meetings at SIGGRAPH and other trade shows may be arranged as well.

- December, 2000.

MEDT and MECT product release.

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