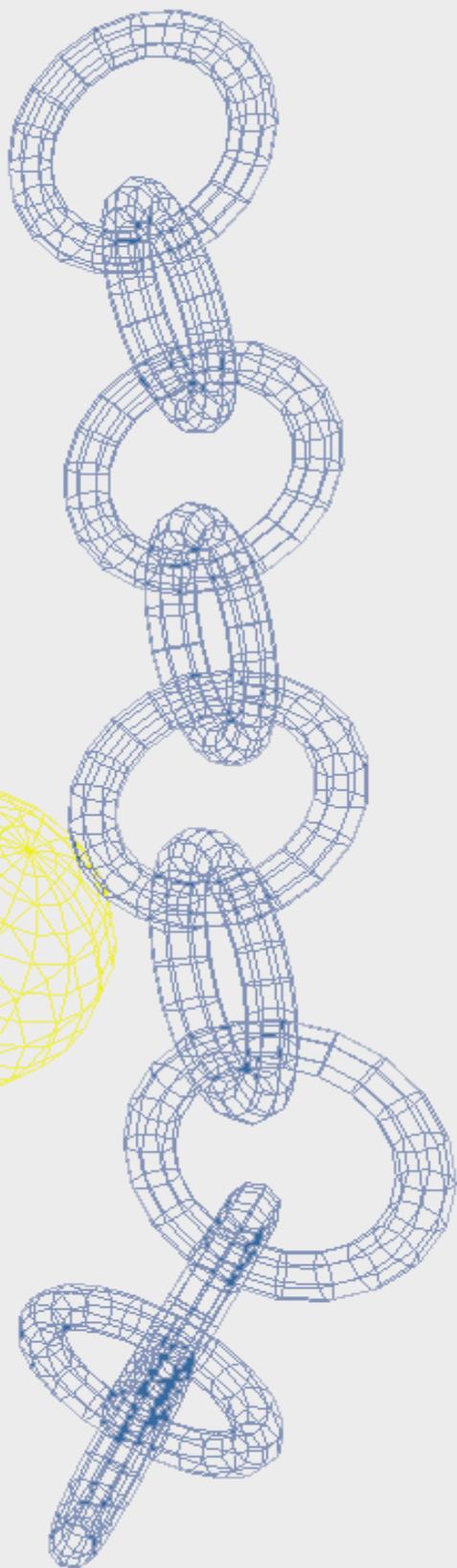


# NextGen Watch

These are the people who know exactly what happens when pixels collide.



**O**ne of the best things about Amiga's partnership with Tao Group is the partnerships the latter company has already established. Tao Group is one of a cluster of forward looking European companies set up to develop Intellectual Property for the digital sector. Unsurprisingly, these companies often find that the IP they are developing complements the IP being developed by another similar company, and partnerships are formed.

**"...current clients include Raytheon and NASA."**

Tao Group's aim is to provide a single universal multimedia layer that can go anywhere; this will be the foundation for digital content (programs and multimedia) in the new Amiga. Thus they have sought partnerships with companies who can bring more multimedia power to their multimedia layer. In the arena of games development they have looked to the brave new world of middleware.

The idea behind middleware is that developers can write to a code layer bought in from a middleware provider which offers many of the common functions required by games. In a way this is the logical extension of a tradition of growing abstraction which existed in a very simple form in the Commodore 64's kernel, extended through APIs such as OpenGL and Warp3D and finds its current form in game development toolkits which can

provide pretty much the entire code engine for the game being developed.

### Powered by MathEngine

We have already heard much about one middleware partner, Criterion. Their Renderware toolkit, currently being used by around 250 games software houses including Activision, DMA Designs, Konami, Interplay and UbiSoft, is supposed to be being ported to Tao's intent multimedia layer. But it's not the only one. In September of last year, Tao formalised a relationship with another UK middleware firm: Oxford based MathEngine, who will be providing 2D and 3D software technology. Although this relationship is still young,

MathEngine and Tao Group have been in communication for some time, and MathEngine are clearly keen to have their libraries available on intent. Lincoln Wallen, the CTO (Chief Technology Officer) of MathEngine told Amiga Active magazine, *"Tao/intent provide OS level services and components that make delivery of our technology faster and more portable."*

MathEngine can't yet boast the numbers of developers Criterion can, but it's early days for them. However, they aren't a simple rival to Criterion, as you might guess when you hear that current clients include Raytheon and NASA. MathEngine combine gaming and engineering with a product line aimed at creating realistic physical simulations. Current users of the system include games companies such as Vivid Image, HotGen, Argonaut and

SmartDog, who are using the software to help create realistic environments and effects for their games. At the other end of the scale, NASA uses it to provide a simulated Martian environment to try out designs for robot probes.

The core MathEngine product is Karma, a development toolkit for rigid body and collision physics. Using it to control the interaction of shapes in a 3D space it is possible to create environments, and objects within those environments, which behave according to the laws of physics. The physics libraries handle the motion of rigid bodies according to definable parameters, including rigid and flexible joints and spring-like connections between rigid bodies. They can account for surface friction acting upon the movement of objects, and collisions between object primitives or arbitrary object meshes, handling many multiple simultaneous collisions and offering a time of impact estimate.

### Good Karma

Karma runs on Windows, Linux and SGLs, the platforms most commonly used for development. The physics libraries will run on a number of target systems, including Windows, Playstation 2 and various embedded systems such as the mobile gaming system being developed by MathEngine in co-operation with Motorola as well as intent, making it much easier for the developer to produce ports of the game or application to all those target systems.

MathEngine also offer a rigid body dynamics plug-in for 3D Studio Max 3.1, the market leading 3D modelling animation software. This allows 3DSMax scenes to be given physical properties, joints etc. Constants such as gravity and behavioural parameters are set globally through a world module.

In creating a realistic 3D game or application, making a believable static environment is trivial compared to making a believable dynamic one. How often have you seen a pretty game spoiled by polygons intersecting each other or not interacting properly? How often have you wanted to push that gargoyle off the battlement to land on the black knight's head but couldn't because the coder never thought of the possibility? This sort of physics engine can change all that.

By giving all the objects in the room physical properties that interact with each other according to algorithms which mimic reality convincingly, the environment becomes a truly dynamic one. You can push the gargoyle, if you are strong enough, and not

**“...the environment becomes a truly dynamic one.”**

**“Having this means that it will be cheaper and easier for software companies to target the new Amiga....”**

only will it land nicely on the black knight's head, it will bounce off and roll along the ground in a convincing fashion too. Perhaps it will land on the edge of a table, causing the table to tilt up and all the objects on the table to fall off. Doesn't that sound a lot more interesting?

### MathVentures

The wide range of uses MathEngine's physics engine can be put to have prompted MathEngine to create several “market-focused” subsidiary companies and joint ventures to take their engine into the academic and engineering sectors.

The first of these, Immersive Entertainment PLC was set up in conjunction with Demis Hassibis' games company start-up Elixir and Oxford University. They produce educational software using the kind of technology normally seen in games development. Their Rochester Cast Siege Game uses some of the MathEngine physics libraries to allow pupils to try their hand at besieging a mediaeval castle.

Lumeo Software, Inc. produces software design to simulate and demonstrate the behaviour of products without having to make a physical model, a sort of virtual prototyping system. The latest offshoot, Critical Mass Labs, provides visual simulation software to the engineering industry, allowing modelling of complex environments for simulation training, robotic design, medical research and similar purposes.

### Compatibility

So what does this mean to the Amiga? We will get a cutting edge physics library, and perhaps more to the point one that works on a number of other platforms as well. Having this means that it will be cheaper and easier for software companies to target the new Amiga platform in the future - if they are working on a program using this engine it will simplify the task of porting to multiple platforms. This is seen as an increasingly important advantage for development in the games sector, where making the wrong decisions about which platform to support can be fatal to a company. Middleware makes it cheaper and easier to cover all your bases. With the total inter-platform compatibility Tao offer, the prospect becomes even more tempting to developers working with the MathEngine middleware.

Another effect is that it helps to bring development for the Amiga into the mainstream. With more common development tools being used for the new Amiga OS and other platforms, not only is it easier for companies to produce ports to the Amiga, it is easier for programmers to get to grips with the new system as well. This will mean that companies interested in developing for the new Amiga are less likely to be put off by the problems of retraining for a new platform target; they will already have coders used to working in development environments that can be used to develop for the new Amiga. The flip side of this is that Amiga developers can learn skills in developing for the new Amiga that will stand them in good stead for developing for other platforms.

The availability of the MathEngine physics library for the AmigaDE will mean that Amiga developers will have another weapon available to them in the struggle to write new and interesting code with the minimum of difficulty.



**Above:** Actor, from Vivid Image. This room is filled with objects that behave realistically - a punch bag you can punch, a useable basketball and hoop, a pool table you can actually play etc.

### Potential

While MathEngine isn't going to suit every developer, it has the potential to help release creative notions which are limited by development issues.

MathEngine CTO Lincoln Wallen told us, *“Amiga developers have a fantastic reputation for innovation; we hope to work with some of the community to enable them to develop content for a range of markets based on consumer devices. Feedback from developers is crucial to us for technology development, and we are keen to enable Amiga developers to make money by producing really exciting content for a range of devices.”*