Crossroads
The ACM Student Magazine

AI and the Rise of Gaming Middleware: an Interview with Pierre Pontevia of Kynogon

by *Audrey Christophory*

*Pierre Pontevia is the Chief Technical Officer at Kynogon SA (**www.kynogon.com**). Established in 2000 by Pierre and his partner, Jacques Gaubil, Kynogon provides the leading artificial intelligence middleware solution, Kynapse, to both the gaming and serious gaming industries. Kynapse 4.0 was released in June 2006. Kynogon recently opened a new office in Montreal, Canada. I sat down with Pierre in the company's Paris office to ask him about his career, Kynapse, and working at Kynogon.*

What is your educational background? I did the École des Mines in France. It's one of the top scientific schools in France, similar to MIT or Cal Tech in the States. I did the five-year program there, specializing in Robotics. I went on to do a year of research at the CAOR laboratory, focusing on image processing and pattern recognition.

How did you get into the field of artificial intelligence? Once I left school, I worked for Matra Cap Systems as an engineer for five years. There I worked on things like image processing, online character recognition, and military target identification. I topped that off with an MBA and worked for five more years as a consultant. Those experiences helped prepare me [to run my own company], but my first love was always AI.

What led you to start up your own company? I grew up in an environment of entrepreneurs. My grandfather had his own company, and my father ran a company too. Jacques [cofounder of Kynogon] claims that it's a genetic predisposition! [laughs]. Having your own company has some serious drawbacks, like not having the kind of

backing that you might find in one of the big companies, but it also means that you can follow an idea as far and as long as you want. I'd always wanted to start my own company, and when the time was right and the elements were all in place, I went ahead.

What are those elements? An idea that fills a specialized niche, a partner who shares the vision, and the means to implement your idea.

***Kynapse* is a leading AI middleware solution, not only among game studios but also with the military and serious gaming industries. Why is that?** The middleware industry, in general, is new. The increasing complexity of consoles pushed clients to seek external solutions for their technical needs. AI, physics, and other areas all have new and emerging middleware solutions. Among these, the new kid on the block is AI middleware.

What makes *Kynapse* special is that it defines the current state-of-the-art of artificial intelligence—it isn't about some fantasy about what AI should do. AI can be divided into two components. High-level AI determines why a character does what he does. Low-level AI focuses on how to do specific tasks well. *Kynapse* only focuses on low-level AI. *Kynapse* is two things. First, it is a highly efficient set of run-time libraries. Second, it is an automatic data generation tool that makes it very easy for game developers to integrate into their engine.

What advantage is there for a studio to use a solution like *Kynapse*? There are actually three aspects to artificial intelligence: path finding, team behaviors, and spatial reasoning.

Basic path finding, going from point A to point B in a small, static environment, is trivial. Today's virtual worlds are huge and very dynamic. You must consider issues like destructibility, [which] changes the location and size of obstacles. You must also consider path objects like elevators or trains, [which] your characters can explore. Finally, in worlds with thousands of NPCs [non-player characters], you must be sure they don't trip over each other. These are all reasons that path finding remains at the heart of AI development.

Kynapse does a lot more than just path finding though. It can also manage spatial reasoning. Spatial reasoning is the ability, in real time, to detect and use points of interest, like hiding spots or resource deposits. Because *Kynapse* can extract its own

topological data, it can handle all kinds of entities. Whether your NPCs walk, fly, or swim, *Kynapse* can help them make use of the entire accessible environment—as opposed to just the ground. That is something only *Kynapse* can do. Better yet, it's simple to achieve because of the *Kynapse* tools.

Finally, there is team behavior. What does that mean? Well, if you send fifty troopers to storm a building, it is a bit silly if they all focus on the same exit. *Kynapse* can make your NPCs behave cooperatively to accomplish complex tasks. Because team members share information, they make use of spatial reasoning as a group.

Kynapse lets game developers benefit from years of focused research so that they can use the most sophisticated AI, without compromising on game speed or artistry.

What it all comes down to is, you can have great graphics and awesome physics, but the game won't be fun if your NPCs are as dumb as dirt.

Is there any risk that all games will start looking the same? No. It is the high-level AI that is closest to game play and that the game developer completely controls. We provide the underlying technology, but the artistry of the game is entirely handled by the studio. Also, *Kynapse* is a highly-customizable SDK [software development kit]. So, really, *Kynapse*, as it is implemented in one studio, is completely different from *Kynapse* in another studio!

What is it like working at Kynogon? Well, Kynogon is a small company. Currently there are only about twenty employees in three offices: Paris, London, and Montreal. With customers around the world, and only two dozen employees, that's important. We still manage to give prompt and reliable attention to all our clients. We have a lot more continuity than people have in studios because we work on one product all the time, rather than various projects. We have a lot less staff turnover too. We get to work with the most prestigious studios in the world. Our developers work on improving *Kynapse* while our developer-relations team works with the developers in client studios to help them use *Kynapse* effectively. Because of our close relationship with console developers like Sony and Microsoft, we get to work with the latest technology—even before it's commercially available!

What do you like best about this industry? The best part is that we work with cutting-edge technology and our customers do too. Today, that means looking at how

we develop *Kynapse* towards multi-core architectures: CPU multiprocessors, Sony Cell, GPU/PPU, or the Xbox 360 multiprocessor. There is a constant challenge to innovate, and there is an intellectually stimulating environment both internally and when we deal with customers.

What do you like least about this industry? It's difficult to plan long-term. It is not always easy to stay reactive when development takes so long.

What advice do you have for students who are just starting their careers? First, that you can never write C++ well enough. There is always more to learn, like dealing with the unique programming constraints of a real-world problem. More generally, working in the video game industry is work! It's not all about playing games. There are many ways into this industry, and the way in depends on a person's ambition. If you want to see your name in the credits, then apply to the studios. But if your interest is to work with cutting-edge technology and contribute to great games, then you should consider a career with a middleware company or a console developer.

What do you look for when you hire someone? The heart of Kynogon remains the programming team. Any addition to that team must be someone who is a good programmer already, and is willing and able to learn to program better. I'm not interested in hiring the genius programmer who cannot communicate what he's doing to anyone else. For me, previous game experience is much less important that enthusiasm and commitment. Kynogon makes a major investment in our employees—we know that it will take six months before a person can become productive. When I hire someone, I want to know that they are going to be around for the long run. They need staying power or it just isn't worth the investment.