

## **FIFA Soccer 08 on Next-gen Blog 3**

Release Date: Immediate

Topic: Shooting and Fundamental Depth

### **Joe Booth, Lead Producer**

Today I have asked gameplay designer and software engineer, Gary Paterson, to speak in the diary. When he's not following Aberdeen, celebrating Scotland's World Cup Win (the homeless World Cup that is), finding the latest Leeds United negative story to rub in my face, or reliving every detail of Scotland's one win over England, Gary is busy tweaking the shooting and the details of our game engine. Seriously, Gary is going to give you some insight into our new shooting mechanics and some of the changes that we have made to the fundamental depth of the game. What has been really encouraging for me about the way our new shooting module has developed is the sense of unpredictability that it creates. Because of the new way players strike the ball you never get the same shot twice. So if you go in the arena and fire shots off at the net, you are never sure if the ball is going to dip down under the bar or rise over the bar or swerve in on the side or not. That creates a sense of drama that's there from the real world. Previously in football engines the shooting mechanics have been too predictable and I think our new model for FIFA 08 creates this authentic sense of unpredictability.

The other thing I really like about the shooting mechanics is the feedback from the animations. There are all these different contexts and factors going on, so if you are off balance the player may still kick the ball but you will see him stumble afterwards, and so it's this kind of feedback that you now get to know that you did not quite connect with the ball. That makes more sense to me than if the ball just flying off and you don't understand why. I'll let Gary go into more detail here.

- Joe

### **Gary Paterson Gameplay Producer**

Thanks for such a 'warm' introduction Joe. Aye, the World Cup win was certainly something to celebrate, the streets of Glasgow were packed that night. Don't feel too bad about the eng\*sh teams performance though. I've heard that your team might be bolstered for the next World Cup by the addition of some Leeds players who will soon be homeless after not receiving any pay in the last 2 months.

### **Shooting**

We have done a lot of work on the shooting mechanics to create added realism and it is a very complex system to explain. The main enhancement we've made is to the shooting system and how we analyze the context to a kicking situation to decide the size and type of error. We have always used the situation the ball is kicked in, like ball speed for instance, to determine the error on the ball. This year in FIFA 08 we've gone further to use more contexts to try to decide how the player kicks the ball, what the ball trajectory will be and if it is going to have back spin, top spin, swerve to the right or the left, etc.

This is the first time we have used this many contexts to determine the trajectory of the ball after a kick and the size of the kick error. We consider things like is the player stretching for the shot, the ball 'y' velocity, the ball incoming velocity, the ball lateral velocity, is the ball under his foot, is the player being jostled and a lot more factors to determine the success or failure of the shot. The trajectories we are now getting out of the game are more realistic than ever before.

### **Factors to Consider**

When you line up a shot, there are a number of factors that you need to consider:

### **Ball Speed**

The greater the speed of the ball when you hit it, the less accurate the kick. Consider whether you should control the ball first before taking your chance. Remember – players that are naturally good at volleys are more likely to hit a difficult ball with precision.

### **Ball Height**

Volleys are spectacular but a difficult skill to pull out of the bag. Overhead kicks are even harder and rarely work out. Maybe you should chest the ball down if you can't get a good header in.

### **Ball Bounce**

If the ball bounces just before you hit it, all the factors that make it difficult to get it on target are multiplied.

### **Kick Power**

The harder you hit the ball, the less accurate you can be – which is why a 40 yard shot on target is so impressive.

### **Player Speed**

The faster your player is travelling the harder it is to control the ball – and if you approach the ball at an angle it becomes even more difficult. Try slowing down before striking the ball for more control – remember, your speed adds power to the shot which can be helpful!

### **Pressure**

The more defensive pressure your player is under when you shoot, the harder it is to keep cool and stay on target. This is especially true if your player is being jostled – only players with good upper body strength can ignore the distraction.

### **Balance**

If your player is off-balance it is far harder to be accurate or to hit with power. You may only have seconds to get a shot away, but given the chance you should consider taking time to regain balance.

### **Right/Left Footed**

If you shoot with the weaker foot then everything becomes harder – from accuracy to power. Either take the extra step or try to make sure players receive the ball on their stronger side.

### **The Player Himself**

You should only try the most complicated and difficult moves with highly-talented players – if a player doesn't have the skills, keep it simple.

In addition, we have changed all of the shooting animations. What we have tried to achieve here is enhance that sense of impact you feel when you strike the ball well. The way we did this is by making the animations a little longer. It may feel counter intuitive to make the animations longer as it obviously affects responsiveness, but for us and what we are trying to achieve, it is a positive thing. If you have ever watched Liverpool and seen Steven Gerrard get the ball with a little bit of space, maybe 25 yards out from the goal, there is a sense of anticipation from the crowd because you know Gerrard has the space and time to strike a really good shot. This is what we have tried to create in FIFA 08. So the game now is more about trying to work the ball into position where you have this time and this space to perform an accurate shot.

As I mentioned, all of the shooting animations have been replaced. We now have power animations, finesse animations, power-finesse animations, weak foot animations, close shot animations, off-balance animations, etc. We have all these different animations partly for visual realism and partly to educate the user why his shot was off so he will know why it was a poor shot. The system we have created is logical and users will be able to understand why something happened, so in that sense it is predictable but it is also unpredictable because there are so many factors involved. You won't get the same shot twice from the same situations because there are so many factors at work. At the same time a user should be able to predict that if they are off balance, sprinting and shooting at 90 degrees their shot is not going to be very accurate.

In determining the success or failure of a shot we don't script the end result. In real life you will actually see shots with error on them actually score good goals. One example we use to illustrate what we are trying to achieve with the shooting system is to look at the fourth goal Germany scored in the opening game of the last World Cup, when they defeated Costa Rica 4-2. It was a free kick from 30 yards out and the ball was laid off for Torsten Frings. His shot actually started off aiming straight at the goalkeeper but swerved away from him and into the top corner of the net. It was like the error on that shot resulted in a goal.

So in terms of the success or failure of a shot we don't script the outcome. But in terms of how we turn all those factors into error is a very complex system and it was one that we have had many iterations on because in order to get the most realistic trajectories you have to approach the problem from a realism point of view. We had to work out where the player's foot would actually kick the ball from and then work back from there. So for example, if you are sprinting in one direction and you try to kick the ball to your left the chances are you are going to strike the near side of the ball which will create a certain trajectory. The process involved trying to use the context and trying to understand how the foot would actually make contact with the ball, and therefore how that contact would affect the trajectory of the ball, and implementing this in the game

One of the other things we did to the game this year was to play around with the speed of the power bar. In real football you have to be very composed when you take a shot and then your chances of an accurate shot are significantly increased. We tried to transfer this composure back to the user. We went with a power bar system that is a little bit faster than it has been on FIFA in the past. If the user gets really excited because he has a really good chance, he still has to be composed on the pad to get a really good shot off.

### **Momentum**

Another improvement we have made to the gameplay this year is to a player's momentum. In real life as the body moves it creates momentum. Defenders will position themselves so that their momentum is advantageous to the situation. So a defender, for example, wouldn't sprint at Cristiano Ronaldo. He knows that Ronaldo can just change direction and then you are beaten. If a player doesn't manage his momentum well in real life than strikers like Ronaldo will just blow past him.

In FIFA 08 we have worked with this idea of momentum so that users we have to be more aware of the momentum of their players as they are performing actions or they will over commit their defender. We didn't manage momentum properly in previous FIFA games so we made it a priority to correct this year. So if you were a striker and you were able to dribble past a defender, the defender would turn and catch up to you because he had a limited sense of momentum. Now we have created a more realistic acceleration curve for how players accelerate from start to sprint. What users will now experience is the balance between defending and dribbling is a lot more sophisticated.

### **Passing**

We have improved passing by making it more intelligent. Our ethos here is that things that are easy for a professional football player to do should be easy for a user to do. A professional football player would not intentionally try to pass to a teammate through an opponent so we have adjusted our passing to make it more intelligent in this case, assisting the user to be able to create more fluid moves.

Another example of this is in the leading that we apply to the pass. If your player is running when making the pass then the ball will lead the player and if the receiver is running, then it will lead the ball into his path so he doesn't have to stop. Again, this creates more fluid gameplay and build up to the play. As in FIFA 07, we also have the semi assisted and manual passing and through passing options which gives more experienced users more freedom in their passing options.

### **Ball Physics – Reynolds Effect**

We felt our ball physics were pretty good so we just tweaked them this year and added a subtle change. Basically we returned how the ball contacts with the ground and moves through the air. One of the more sophisticated concepts that we have added is the effect of turbulence on the ball trajectory.

The basic idea of this is that at certain speeds, the threshold of which is denoted by something called the Reynolds number, the spin of the ball will have a reduced effect on its trajectory. If you remember the goal Roberto Carlos scored against France where he kicked it with the outside of his foot and swerved it around the wall, this was actually the Reynolds affect in action.

Roberto Carlos struck the ball so hard for that first 10 yards that there was no effect of spin but once the ball got past the wall, the ball slowed down enough for the spin to take affect and the ball swerved into the goal. This is a subtle nuance but gives you an idea of the level of simulation that we are aiming to achieve.

### **GoalKeeping**

We have also tried to humanize the goalkeeper this year. We have re-worked the save animations to make them more human. We felt like some of the saves didn't look visually realistic last year so we have re-worked them and made them a little longer to give you a better feeling of what that save felt like.

We have also adjusted the way the goalie prepares for a shot. In real life when someone is about to take a shot the goalie will hop a little forward and he'll get himself in a crouch to narrow the angle to get more spring in his reaction. We've added this to the game. We've also put in anticipation saves. If you are 1-on-1 with the goalie and you are really close, the goalkeeper will know he doesn't have time to react to your kick and then choose a save so as soon as you start to kick the ball he will spread himself big in anticipation of the shot, just try to get a piece of the ball.

### **Collisions**

Everyone on the forums let us know the collision system in FIFA 07 wasn't very good so we have improved it so that our collisions are a lot more realistic than last year taking more account of player momentum and the concept of a player's center of gravity.

### **Player Positioning**

We received a lot of feedback from last year's game that player positioning wasn't very good so we spent a lot of time working on this. We also developed more sophisticated conceptual awareness in the AI of each player which has really improved man-marking. This is called a Threat Map. Our goal with the gameplay engine rewrite was to unlock the power of the Xbox 360 for gameplay, so now each AI player views the pitch through a new threat map system, analyzing and reviewing over a 1,000 options per second. So now, rather than just marking players, or keeping zone positions, they will defend space, pushing attackers into a safer position before going in for the tackle.

The Threat Map AI system analyzes the pitch for players in threatening positions so defenders will position themselves appropriately. Essentially individual players have their own brains and are capable of processing multiple things going on around them in order to behave more realistically. We have combined this with a special analysis tool which breaks down the pitch into areas that each player owns.

Each player will have an idea that 'this is the space that I own on the field' and this will responsibility will be processed along with the Threat Map system to decide where a player should position himself on the field, when he should provide run support, where to make incisive runs. On top of that we will layer in where the defenders are so that if there is a threatening position and four defenders are already in place, than other defenders will consider this when deciding where to position themselves.

These are the concepts that we have added to the intelligence of the strikers and defenders that will help them to decide where to position themselves. For example, if there is a threatening area on the pitch for an attacker to be located but no defender nearby, then the defender might choose to position himself

there rather than man-marking a striker in a low threatening position. Or sometimes two defenders will mark one striker if that striker is in a very threatening position.

- Gary