by Richard Rouse III

Embrace Your Limitations

"Cut-scenes" have been featured
prominently in computer games
for at least the last decade, and if
 one looks hard enough one will
notice their presence in games
even older than that.   A good early
example is Pac Man, which sported
amusing little interludes between some levels, featuring the
characters from the game in humorous comic sketches.   These

functioned as a

reward to the player for getting through N-many levels of the

game, and the

promise of still-more cut-scenes later in the game provided

extra incentive

for addicted kids to pump still more quarters into the arcade

cabinet.   In some

limited way, the Pac Man cut-scenes also told a story to the

player, filling

him in on, say, just what Pac Man and Ms. Pac Man did when

they weren't

eating little white dots.

The appeal of cut-scenes to designers who wish to tell stories in

their

computer games is obvious.   Instead of working in the tricky

and mostly

unexplored arena of storytelling in a completely interactive

environment -

that is to say telling stories during the actual gameplay -

designers are able

to convey whatever plot elements they feel necessary through

non-

interactive segments which actually interrupt the gameplay

proper.   For

instance, if a designer absolutely wants the player to see nasty

boss monster

Gargantutron tunneling out of the ground and has a really nifty

effect for the

else when

away the player's

a pre-

of the Earth.

predominance of non-

entertainment

movies, as

attest.

But I'm not arguing for the elimination of non-interactive cut-scenes

useful tool

scenes which

movies which

the one that

this is the

same, why risk that the player may be looking at something

Gargantutron shows up on the level?   Instead, briefly take

control of what he or she looks at, and force the player to watch

rendered animation of Gargantutron emerging from the bowels

Another, perhaps more cynical explanation for the

interactive cut-scenes in games is that the interactive

industry is riddled with people who wish they were working on

anyone who has worked in gaming for any amount of time can

in interactive entertainment.   Far from it, I see them as another

in interactive storytelling.   What concerns me most are cut-

don't graphically fit in any way with the game they supplement,

seem to have been filmed in an entirely different universe from

the player encounters in the game itself.   Surprisingly enough,

norm for our industry.

Methods that Lead to Inconsistency

The worst case scenario is when computer game cut-scenes are

sourced to film or CGI houses which have nothing or very little

creation of the in-game graphics, and are merely working from

sketches provided to them, or, worse yet, vague text

storyline is supposed to unfold in each given cinematic.   As a

often than not game cut-scenes look nothing like the art which

gameplay.   Instead of functioning as smooth transitions

segments in the game, the cut-scenes become jarring

break any suspension of disbelief the player might have

playing the game.

In terms of visual incongruity, the worst offender of all seems to

out-

to do with the

concept

descriptions of what

result, more

appears during

between interactive

disruptions which

developed while

be

the gaming

moving away

often badly

gameplay

digitized

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true that filmed

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animator might

the live-action video cut-scenes which were so ballyhooed in industry five years ago and which now everyone seems to be from.   Aside from the fact that these live action segments were filmed, acted, and scripted, the visual dissimilarity between the graphics (be they either sprite-based or real-time 3D) and the actors appearing in the cut-scenes should have set off warning designers' or producers' heads.   It seems almost inherently actors are going to stick out like so many sore body parts from graphics, and achieving any sort of visual continuity between gameplay visuals is all but impossible.

One would think that pre-rendered CGI cut-scenes would have more suited to providing continuity with gameplay graphics, but than not this simply isn't the case.   Though I'll be the first to scenes have come closer than live action video cut-scenes, look they are taking place in a realm altogether different from which the gameplay takes place.   This is mainly because artists are relatively free to use whatever quantity of polygons they a pre-rendered scene, whereas polygon counts used during segments often need to be strictly limited.   And artists have to make whatever bit of art they're currently working on look as possible, and if they're able to use a million polygons in the pre-cut-scenes they're certainly going to use them, even if they gameplay artwork.

For instance, consider a game which uses a real-time 3D as Quake.   In such a gameplay environment, artists and limited in the number of polygons they can use, since the handle N-many polygons on the screen at once.   So while an want to use at least several thousand polygons for a vaguely

realistic

hundred.   From

accustomed to using

having to use a very

to limit

due, swearing

models once again.

Gods!   The

want, since these

just played

artists goes

game model of two

hundred fold.   What

different one

scene

graphics

gets to one of these

computer-

look this

humanoid figure, the game engine limits them to a couple of

my experience, few things frustrate animators who are

whatever polygons are needed for a piece than suddenly

small number.   But, forced (often at gun-point) by the producer

themselves to only a few hundred polygons, the artists make

that someday they'll be able to make really swell looking

And then, when it comes time to do the cut-scenes, praise the

animators are now free to use however many polygons they

scenes are pre-rendered on Silicon Graphics machines and then

back in the game as Smacker or Quicktime movies.   And so the

wild, using as many polygons as they want, taking their in-

hundred polygons and increasing its count ten or even a

the heck, they may throw out the model and make an entirely

just for use in the cinematic.   This results in high-poly cut-

renderings which - though beautiful - barely resemble the

displayed during the actual gameplay.   And when the player

cut-scenes she can't help but think (unless she's a particularly

graphics savvy lady), "Man, why can't the graphics in the game

good!"

Some Games that Get It Right

But not all games are guilty of making their cut-scenes look
exceedingly different from their in-game graphics.   A good

example of a game

described as

infected with a

cut-scenes

especially beautiful

scenes match

that gets its cut-scenes right is Interstate '76.   Probably best

the Car Wars role playing game done in an arcade game style

1970's America sensibility,   the game includes many well-done

which add immensely to the gaming experience.   What's

about the game's non-interactive interludes is that the cut-

palette used, the

the

cohesive

same universe.

cut-scenes

if one

polygons on the screen

engine.

techniques, the scenes

player is, after

benefits by using

gameplay, as well as

but primarily

experience for

visual

rendered gameplay,

use of the game's

scenes used in

example of

back in the early

scenes were

any event, their

visual continuity is

in

in particular

visually with the gameplay graphics.   In terms of the color low-polygon look all the characters have, and the stylization of characters the gameplay and the cut-scenes form into one storytelling whole.   Everything looks like it takes place in the

Some animators have been quick to point out to me that the for Interstate '76 are not actually that low-polygon, and indeed examines the scenes closely one will count many more than could actually be rendered in real-time using the game's However, to the layman who's not so savvy to graphics look similar, even if they're technically not, and "fooling" the all, what we're ultimately concerned with.   The game also identical voice-acting during both the cut-scenes and the having the cut-scenes lead-up directly into the gaming action, it's the consistent visual look which makes the game a smooth the player.

However, though Interstate '76's designers managed to create cohesion between pre-rendered cut-scenes and real-time an even better method sure to yield consistent results is the primary graphics engine to handle the cut-scenes.   Those cut-Pac Man I mentioned previously are a good, though simplistic, this.   There was no technology for pre-rendered movie play-1980's when Pac Man was released, and I'll bet that the cut-hard-coded manipulations of Pac Man's graphics engine.   In graphics match exactly with those found in the game, and maintained throughout.

Some more modern examples come to us in a number of games development which have licensed the Quake engine.   Two titles

use the game's
scenes the
interludes are
the rest of
able to show is,
instead of hard-
complex
characters on the
polygon limitations,
prevent a
non-interactive
action, the
segments of
emphasis on
consistent
the player.

scenes
quality of the
player will see
technology has vastly
better as the
take an expert to
screen versus
during
inconsistencies go
player.

spring to mind: Sin and Half-Life.   These games, like Pac Man,
regular drawing capabilities to generate, in real-time, the cut-
player sees.   This of course means that the non-interactive
subject to the same polygon count restrictions prevalent during
the game, and the complexity of the scenes the designers are
as a result, quite constrained.   It's my guess that both games,
coding their cut-scenes as Pac Man no doubt did, use a special,
scripting language to govern the placement and movement of
screen, as well as the movement of the camera.   Despite
the cut-scenes I have seen for Sin are quite well done, and
wonderfully seamless continuity between the interactive and
segments of the game.   Though I have yet to see Half-Life in
screen-shots I've seen from both interactive and non-interactive
the game seem to match perfectly, and with that game's heavy
storyline, it's good to know that game will present its story in a
visual style, allowing for the maximum amount of immersion for

A pleasant side effect of using the game's engine to handle cut-
is that the resolution, screen-size, frame-rate, and overall
cut-scenes on the player's screen are all identical to what the
during gameplay.   Though pre-rendered movie playback
improved in recent years, and said playback gets better and
megahertz speed of the target platform increases, it doesn't
spot the pixelation that occurs when a movie is playing full-
the usually much sharper (if lower poly) graphics one will see
gameplay.   Using the in-game engine, these graphical
away, providing the smoothest possible experience for the

An Old Pro

long as

Prince of

three of these

adventure, all

but Prince of

interludes.   The

graphical

Not too long ago

Games

the game's

effort to make

He answered:

games is that if

experience as if

should have a

player and for

Cut-scenes and

to the same

say you're in

corridor,

seeing him

August, and without

Then as soon as

when you cut

again."

A designer who has been putting cut-scenes in his games as anyone is Jordan Mechner, creator of Karateka, Prince of Persia, Persia 2, and most recently The Last Express.   Though the first games are arcade adventures and the last is a more "pure" masterfully use cut-scenes to communicate their story, and all Persia 2 use the gameplay graphics engine to render these result in all the games is a very cinematic feel, with complete continuity between the gameplay and non-gameplay sections. I had the pleasure of interviewing Mr. Mechner for Inside Mac magazine.   One of the questions I asked him was if his use of gameplay graphics engine in the storytelling interludes was an those cut-scenes visually indistinguishable from the gameplay.

"Absolutely.   I think part of the aesthetic of all three of those you sit back and watch it, you should have a smooth visual you were watching a film.   Whereas if you're playing it, you smooth experience controlling it. It should work both for the someone who's standing over the player's shoulder watching. the gameplay should look as much as possible as if they belong world...   [This is the] basic principle you have in Last Express: point-of-view, you see August Schmidt walking to you down the then you cut to a reaction shot of Cath, the player's character, coming.   Then you hear August's voice, and you cut back to realizing it you've shifted in to a third-person type of scene. it's over, August walks away, cut to Cath looking at August, and back you're back in point-of-view and now you're controlling it

Mechner makes an interesting point that the player, who

interacts with the

it as he would

viewing the

break in the

might make

switch, lost

who's just watching

render

frames that

break in the

control whenever

agree with you

they make you feel

were going for at

getting

cutting down on

particular, we

less than 24

object in the world

at once.   One of

pyramids - a larger

we'd have a

represent a

project's

game directly, and the over-the-shoulder viewer, who watches a movie, should both have a smooth graphical experience while game.   Whereas one might be able to argue that a stylistic graphics between the interactive and non-interactive sections some sense to player who has, simultaneously with the visual control of their game, it makes no sense at all to someone the game and not playing it.

The only Mechner game that didn't use the game's engine to cut-scenes on the fly was Prince of Persia 2, which used still-appear hand-painted for its interludes.   These create a sharp continuity of the game, emphasizing to the player a loss of they come up.   I mentioned this to Mechner, and he replied: "I about that.   There's a distancing effect to those cut-scenes, like you're watching a story-book.   But it was the effect we the time."

Embrace Your Limitations

Recently some coworkers and I were discussing the problem of our game - the forthcoming Centipede 3D - to run faster by the polygon counts of various objects in the game world.   In talked about how we could make a decent looking mushroom in polygons, since mushrooms are the most commonly found of Centipede, sometimes with 70 or so appearing on the screen them pointed out that the best way would be to have two one on top of a smaller one - and in such a simple construction model that, in a minimalist or perhaps even cubist way, could mushroom.   I was suddenly struck by the idea that if, from the inception, we had striven for a more minimalist look, both our

frame-rate

been resolved.

instead looked

have had insects

gamers would

epithet

from all

statement as less

attempting.   As game

what our

while working

going to be

consistency

style to the

many polygon as

use a few

for

are four

of them from

in-game art?

shots looked as

over the eyes

But in a

the game until

importance of trying

effect which leads

problems as well as our artistic inconsistencies would have

Instead of having insects that tried to look real but failed and

like they were made out of (at most) 90 polygons, we could

that looked like cubist representations of insects and which

recognize as deliberately in that minimalist style.

At this point in the discussion I blurted out the half-joking

"Embrace your limitations!" which got a big round of guffaws

present.   But thinking about it later I came to see the

humorous and more generally true to what we should be

creators, we need to recognize early in the development cycle

limitations are, and figure out how we can make the best game

around those limitations.   And if the in-game graphics are only

able to use N-many polygons, and we all agree that visual

demands that we make the game's cut-scenes be of a matching

gameplay art, we need to make the cut-scenes have only N-

well, or at least appear to consist of as few polygons, even if we

more to "round off the edges."

Of course all is not so easy for the game designer who strives

visual consistency.   What of the marketing people who, if there

screen-shots on the back of the game's box, like to take three

the beautiful, movie-quality cut-scenes and only one from the

They would surely cry bloody murder if now all of the screen-

"bad" as the gameplay graphics.   How would they pull the wool

of the gaming public if the game had a consistent visual style?

perfect world, where the marketing people don't take a look at

it's done, I hope that we as designers and artists see the

to maintain a visual smoothness throughout our games, an

product.   Until
interactive
possible both
whether she's
shoulder.

to the player perceiving the game as being a more professional
the day comes when there are no non-interactive cut-scenes in
entertainment, we need to make our games look as similar as
when the player is interacting with them and when she's not,
playing the game herself or watching it over someone else's

Nemesis and
on the
pronouce
can

Richard Rouse III is Lead Designer and President of Paranoid Productions
which has published two games to date: Odyssey - The Legend of
Damage Incorporated.   He also served as Lead Designer/AI Programmer
recently published non-Mac (gulp) Centipede 3D.   He would like to
that he loves the city of Elgin, Illinois.   Feedback to the above blatherings
be directed to paranoid@panix.com.