

Who is Ernest Adams?

- I am...
 - An independent consultant, author, and teacher
 - A 16-year veteran of the computer game industry
 - (Including 8 years at Electronic Arts)
 - The founder of the IGDA
 - A visiting fellow at the University of Teesside, UK
- My perspective is that of the professional entertainer, not the scholar.
 - A lot of my work is helping people to commercialize their experimental projects.
- In that role, my goal is to make VR/AR/MR an **aesthetic** and **commercial** success.
- For that it must also be a **technological** success. ²

Let's Start With Technology

Some VR Technology Options

- Classic HMD and gloves
 - Not yet great for video games
 - They make you seasick!
 - There are narrative and sociological issues.
- AR devices
 - There are safety issues if vision is occluded.
 - Frankly, most players would rather sit!
- Caves (multi-wall projectors)
 - You can move, but not very far.
 - Good for small groups.
 - Good for location-based entertainment.
 - Battletech centers were an example

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Ray Bradbury's Dark Visions

- **Fahrenheit 451**
 - Interactive soap operas on wall-sized TV screens.
 - Wall-sized TV screens are possible now, but not used.
 - We have interactive soap operas now (but not good ones).
- **"The Veldt"**
 - An entire room devoted to gameplay: walls, ceiling, floor
 - Not many people have complete home cinemas today.
 - It's overkill; HMDs would be cheaper and more effective.
- **The "home cave" might be technically possible, but it's sociologically unlikely.**
 - Housing used to cost 25% of income, but now...
 - ...it's at 40-60% and rising.
 - The limitation is not the tech but the living space.

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Farther in the Future

- **The all-over VR body suit**
 - Only as a very high-end option for fanatics
 - Equivalent to ThunderSeats for flight sim fans
 - Too much time, trouble, and cleaning!
- **Jacks into the brain (cyberpunk fantasy)**
 - Only nerds think this is cool.
 - Normal people think it's disgusting.
 - Why jacks? Wireless! Wireless!
- **And of course there's that holodeck...**
 - We'll have to re-write Einstein first.
 - $E=mc^2$ means you need a lot of energy to make a very small amount of matter!

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What's VR/AR/MR Good For?

- **Education and Training**
 - Learning about things and places elsewhere
- **Museums and Installations**
 - Virtual exploration and artwork
- **Research and Visualization**
 - Analyzing data in 3 dimensions plus time
- **Industrial Applications and Medicine**
 - Remote surgery, teleoperation of equipment
- **Creative Applications**
 - Design tools, testing tools
- **Traditional storytelling or games? Hmmm?**

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VR and the Movies

- **In the movies:**
 - The camera sets the POV and the frame.
 - The frame makes us see what the director wants.
 - A movie is not a single continuous shot.
 - It's hundreds of shots carefully edited together.
 - This creates an aesthetic and emotional experience.
- **With VR (in the HMD sense):**
 - We can look in any direction at any time.
 - So we might miss something important.
 - The experience is continuous.
 - Cuts in time and place would feel like teleporting.
 - They destroy the sense of being physically present.
 - VR movies would need a new grammar.
 - They can't simply copy what the movies do now.

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It's not clear that VR will bring that much to *conventional*, linear, non-interactive entertainment storytelling of fiction (VR movies).

We've had 3D for movies for 50 years, but we hardly ever use it.

VR is therefore best for interactive experiences.

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The VR Gorilla-Rhino Test

- Zoo Atlanta has a VR experience in which you act like a gorilla.
- You must present yourself as a juvenile; i.e. don't annoy the dominant males!
- At the zoo, I also fed an apple to a rhinoceros.
 - (I put my hand right into its mouth – really, not in VR.)
- From this I created a test of VR affordance.
- VR technology must be able to let me:
 - Present myself to the world as a gorilla.
 - Feel the sensations of feeding a rhino.



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Game Industry Interest in VR/AR

- Industry got interested 7-8 years ago, but quit
 - Prices too high, quality too low
 - Depth perception not needed in many games
 - Console gameplay is often a group activity
 - Doesn't work so well if they're in HMDs.
- It will come, but only when:
 - Quality of the experience is high enough
 - Frame rate, resolution, 3D audio
 - We solve the motion-sickness problem
 - HMDs are cheap, lightweight, and durable (< \$50)
- AR/MR entertainment will be a niche market.
 - It will be good for location-based experiences.
 - Big, conventional game publishers won't bother but it could be a lucrative market for somebody.

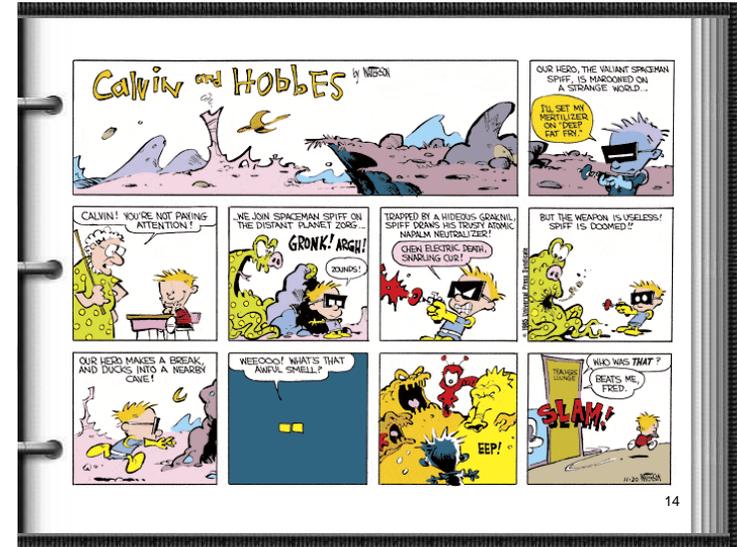
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Technological Determinism

- This is a term from media theory.
 - It means, "assuming that technology will always advance," and...
 - "Technology is the answer to all our problems."
- It is *axiomatic* in the game industry.
- It is not even relevant in literature and art.
 - People studying literature still use pathetic 5-year-old computers.
 - But people making video games still use pathetic 1000-year-old storytelling! (The Hero's Journey)
- I'm not worried about the technology of VR.
- I'm worried about aesthetic credibility.

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Some Tests of Aesthetic Success

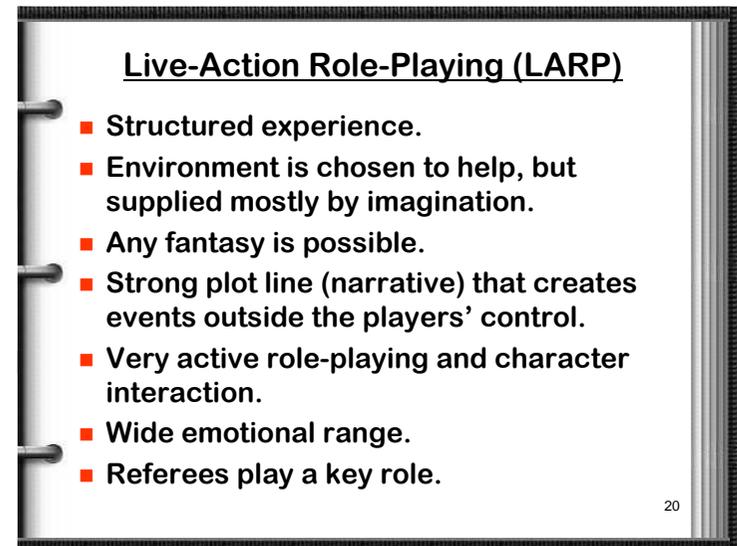
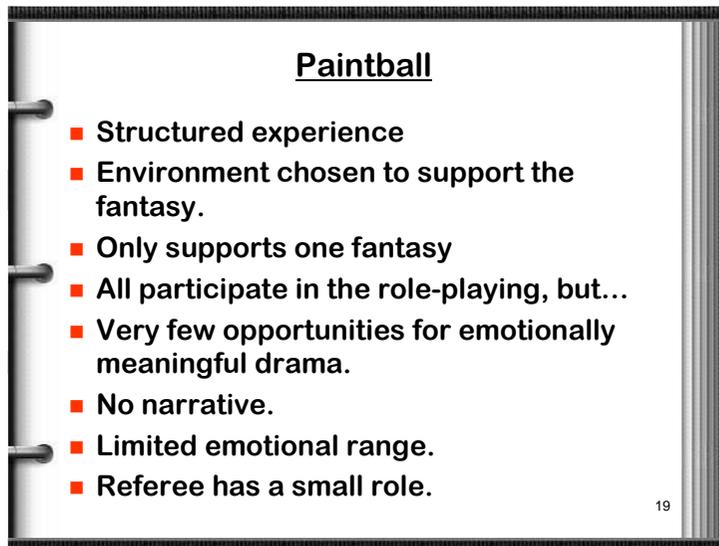
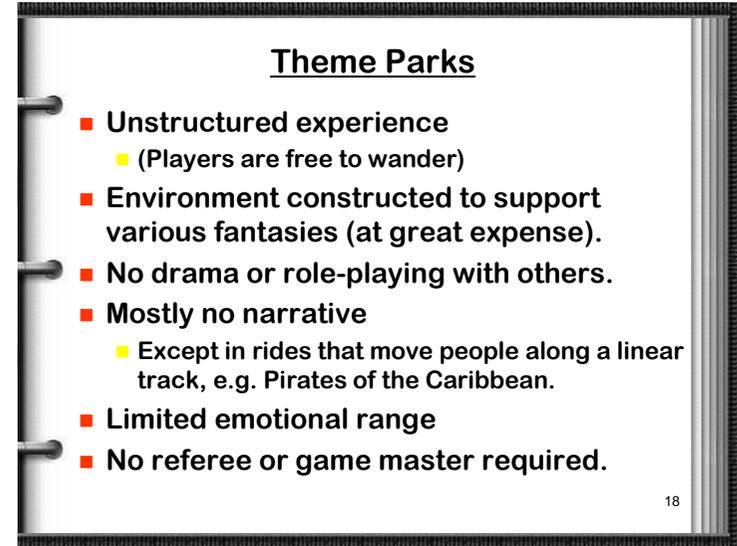
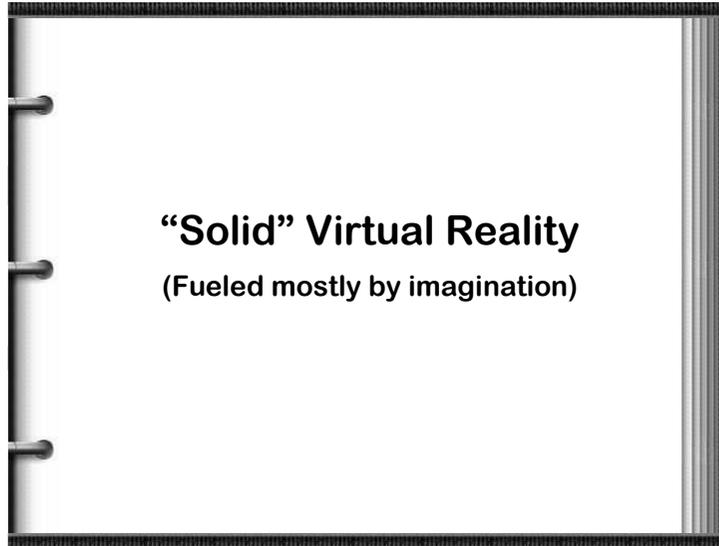


Anyone who's done time with a small child knows that **reality can be highly situational...** Fantasy is so **accessible**, and it is joined with such **force and frequency**, that resentful parents like Calvin's assume they are being manipulated, when the truth is far more frightening: **they don't even exist.**

— Garry Trudeau, in the foreword to *Calvin and Hobbes*

An Early VR Experience, 1968

- This was the equipment I used.
- I used to go to the public library on the bus. I would read one of the books on the way home.
- One day I got so involved in my book that I missed my bus stop and had to walk back.
- This is another test of VR quality: missing the bus stop.



The Aesthetic Challenge

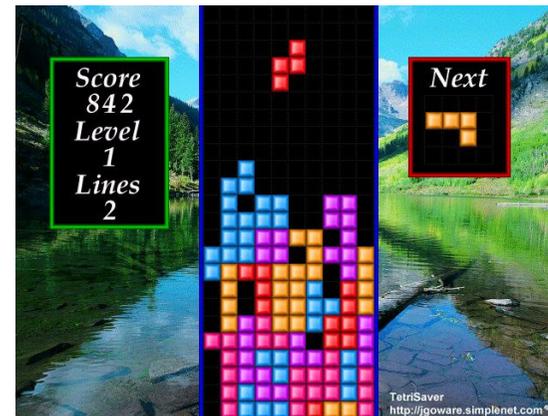
What is "Virtual Reality"?

- A lot of high-tech gear and 3D models?
 - Not if we're not interested in the experience.
- A sense of *seeing* or *being* elsewhere?
 - You can get that with 3D movies.
- "Suspension of disbelief"?
 - (This wasn't really what Coleridge meant...)
- An absence of present cares?
 - I wish! ... but we're getting closer.
- Immersion in an experience we **care about**.
 - Virtual reality is technology-agnostic.
 - "Care about" is the hard part.

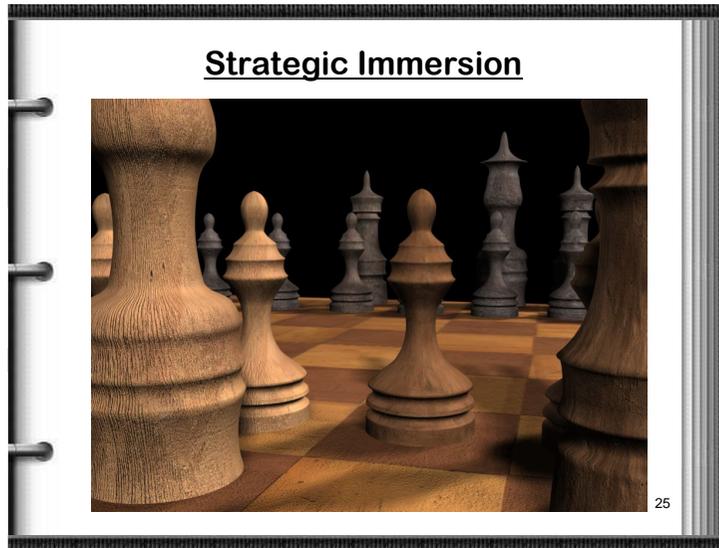
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Three Types of Immersion

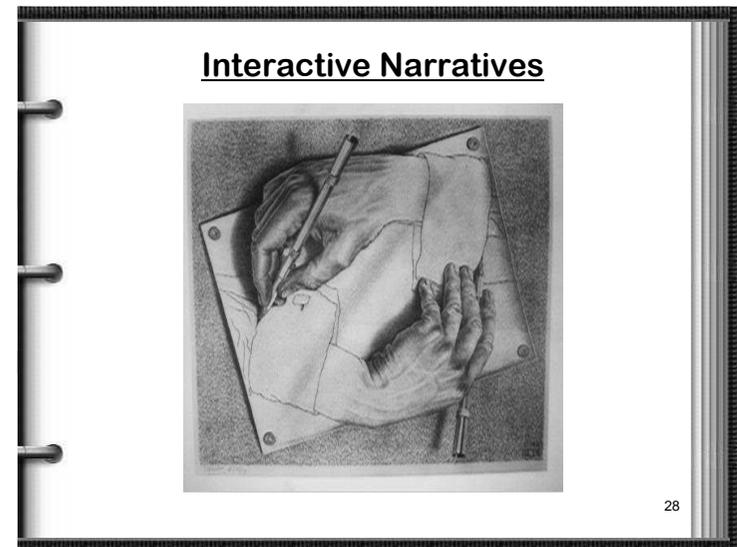
Tactical Immersion



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- ### Tactical, Strategic, Narrative
- **Tactical and strategic immersion are easy to achieve.**
 - They are forms of problem-solving.
 - If the player wants to solve it and is good at it, he will become immersed.
 - **Narrative immersion is more difficult.**
 - The narrative must be credible.
 - Children are credulous, but adults are not.
 - Children live their lives in VR anyway!
 - Many things must work together:
 - Plot, characterization, acting, presentation
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A Little History

- The earliest computerized interactive narratives were text adventures.
 - They used typed input commands.
 - There was no list of allowed commands given.
 - They *pretended* you could do anything.
 - (Of course, this wasn't true.)
- **Ultimate player freedom** became our goal.
 - "Someday we'll have a game where you really *can* do anything you want."
- I adopted this assumption without even really thinking about it. Most of us did.

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"Interactive Storytelling isn't a Game"

- Our second assumption was that we should abandon the "game" concept.
 - Struggle, challenges, conquest, victory.
 - "Game" implies light, fun, meaningless.
 - If something doesn't matter, it's "only a game."
- Stories are **more important** than games.
 - Games are made by nobodys.
 - Stories are made by de Maupassant, Chekhov, Virginia Woolf, J.D. Salinger.
- To broaden our medium and gain cultural credibility, we made this assumption too.

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"Computer Games Have No Rules"

- In normal games you have to obey rules.
 - This is a conscious process.
 - There is a list of permitted/prohibited actions.
 - You are aware of the rules at all times.
- Video games, however, hide the rules.
 - It knows them, so you don't have to.
 - Permitted actions are implemented by the UI.
 - Prohibited actions are simply not available.
- So players have concluded that **if they can do a thing, it must be permitted**.
 - (This has caused problems in MMOGs.)

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Interactive Narratives

- I don't believe they are mutually exclusive.
- But I have long argued (CGDC 1995) that there is an unavoidable inverse ratio.
- Narrative:
 - Is about what the **author has to say**
 - You have to go where she wants to take you
- Interactivity:
 - Is about what the **player wants to do**
 - Its purpose is to fulfill the player's fantasy
- We have to find the right balance for a given game.



Interactive Narratives

- We've been struggling with this for 25 years.
- We do it very well right now in a limited domain, action-adventures and *Half-Life*.
 - We're good at interactive Schwarzenegger movies (all action, no character or emotion).
- But can we make them in other contexts?
 - Can we make an interactive romantic comedy?
 - Soap opera?
 - Political thriller?
- We're OK at letting players interact with plots.
- We're bad at letting players interact with characters.

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You know, the suspension of disbelief is **fragile**. It's hard to achieve it and hard to maintain. One bit of unnecessary gore, one hip colloquialism, one reference to anything outside the imaginary world you've created is enough to destroy that world.

— Brian Moriarty, "Listen: The Potential of Shared Hallucinations," 1997 GDC Lecture

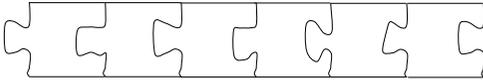
The Human Mental Response to Storytelling

- An ordinary story is a linear jigsaw puzzle.
 - Everything must fit together.
- This is how the reader *understands* and *believes* what is happening.
- This is also how the reader feels *emotionally satisfied*.

READER



STORY



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The Story as a (Linear) Jigsaw Puzzle

- If a piece is missing, or the wrong piece is there, then the reader is confused or will not like the story.

READER



STORY
(part missing)



STORY
(wrong part)



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Three Problems for Interactive Storytellers

- 10 years ago I introduced 3 problems at the Game Developers' Conference
 - The Problem of Internal Consistency
 - "How do we make sure the player behaves in a way that is consistent with the story?"
 - The Problem of Narrative Flow
 - "How do we make sure the player is ready for the dramatic climax when it occurs?"
 - The Problem of Amnesia
 - "What do we do about the fact that the player knows nothing about the world he supposedly lives in?"

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The Problem of Internal Consistency

- How do you make sure the player fits the jigsaw puzzle together correctly?
- Suppose the player's avatar is Superman.
 - Can Superman ignore someone who needs help?
 - No. Superman always helps. Otherwise he is not Superman.
 - What if the player *wants* to ignore someone who needs help?
 - Either the player violates Superman's nature, or...
 - We take the player's freedom away.
- Do we want a "correct" jigsaw puzzle, or do we want the player to have freedom?
 - We'll come back to this...

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Embedded vs. Emergent Narratives

- We've been saying "The game *is* the story."
 - But what did it really mean?
 - We were also writing non-interactive story-material.
 - Marc LeBlanc* proposed that:
 - Embedded: story is told from pre-written blocks.
 - Emergent: story arises as a property of the game system, its core mechanics.
 - Many weaknesses of interactive narratives arise from the embedded nature of the stories.
 - (Those three problems I mentioned.)
- * "Emergent Complexity, Emergent Narrative," GDC 2000

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Can We Make *Good* Emergent Narratives?

- LeBlanc observed that:
 - They don't give the player much guidance.
 - Players need to know where they're going and why.
 - Emergent properties don't always support the fantasy you want to create as a designer.
 - Sometimes you get absurd fantasies
 - (*The Sims* is emergent but it tells poor stories.)
 - Because emergent narratives are based on mathematical models, you get some familiar problems:
 - Degenerate strategies, unintended feedback loops.
- I further observe that:
 - They require a redefinition of the idea of *authorship*.
 - Traditionally-trained writers will have big problems with this.
 - (They're not used to writing their stories in Excel!)

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Perhaps the solution is to stop thinking about *plot* and start thinking about *characters*.

In other words,
Interactive Drama.

Let's look at two examples.

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The Erasmatron

- Chris Crawford
- An attempt to build a *general* rule-based drama engine.
- Story emerges from the engine.
- As LeBlanc predicted, sometimes it produces absurd results.
 - When this happens, Crawford introduces more rules.
- It's up to about its fourth generation now.
 - Nothing has come out of it that you can play with.

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Façade

- Michael Mateas and Andrew Stern
- An interactive drama about a *specific* situation
 - The story is a combination of emergent *and* embedded material.
- Sometimes it produces absurd results too.
 - If you do things that it misunderstands, the computer characters kick you out of the house!
 - When this happens, Mateas & Stern just shrug.
- It's only in its first generation.
 - It's imperfect but complete.

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Façade

- You are the friend of a couple whose marriage is in trouble.
- You're visiting them for a drink. The interactions available are touching, moving and talking by typing in text.
- There is no "goal" but there are several possible outcomes depending on how you behave.



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A Bizarre Façade Playscript

(Audrey [the player's character] knocks on the front door.)
 (Trip opens the front door.)
 TRIP: Audrey!!
 AUDREY: Trip, I've been shot!
 TRIP: Hi, it's so great to see you!
 AUDREY: Help me!
 TRIP: Uh, well, come on in... Uh, I'll... I'll go get Grace.
 AUDREY: There was a man with a gun.
 TRIP and GRACE: (Unintelligible arguing)
 AUDREY: HELP! I'm going to die.
 GRACE: Hi! How are you? I'm so happy to see you after so long!
 AUDREY: For God's sake, I'm bleeding... (etc.)

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Does This Make Façade a Failure?

- People make fun of Façade because it doesn't react correctly to *every* input.
 - They're assuming it should try to be universal.
 - Mateas and Stern never claimed it would be.
- What if Façade were a game after all?
 - Games don't try to be universal.
 - Nobody expects them to be.
 - You can't shoot people in *Monopoly*.
 - *Grand Theft Auto* is widely praised because you can do so many things...
 - ... as long as those things are driving cars, killing people, and having bad sex.

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Façade as a Role-Playing Game

- Role-playing does not mean total freedom.
 - Role-playing games still have rules and a magic circle.
- Going into Façade and saying, "I've been shot!" is *just bad role-playing*.
 - What if I play a war game as a pacifist, or a business game as an anarchist? I will *lose*.
- Being kicked out of the apartment, or confusing the artificial characters, is not a sign of a bad drama engine.
 - It is a sign that you are a bad player.
 - It means you have *lost the game*.

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That Violates Our Assumptions

- "The goal is **ultimate player freedom**."
- Maybe that's not tenable in social contexts.
- "Interactive stories **shouldn't be games**."
- Maybe games bring a beneficial structure.
- Maybe they *require the player* to behave in ways consistent with the storyworld.
- "If you *can* do it, **it must be allowed**."
- That's not tenable in social contexts either.
- It's OK for actions involving physical activity.
- It's problematic when the action is speech.
 - (Freedom of speech doesn't mean you are allowed to shout "Fire!" in a crowded theater.)

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Maybe we need to think of interactive storytelling and interactive drama as games after all!

Maybe they are role-playing games in which the players simply have to play within their role, or they'll lose.

Does that destroy immersion?
No! Obeying the rules helps it.
Breaking the rules destroys it.

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Huizinga and the Spoilsport

- Johan Huizinga claimed that there is a difference between a *cheater* and a *spoilsport*. (*Homo Ludens*, 1938)
- A cheater is still inside the magic circle. He still tries to win. He does not want to be discovered.
- A spoilsport destroys the circle. He ruins the game for the others.
- Huizinga said that the penalties for being a spoilsport are more severe than those for being a cheater.

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Koster's Law:

The quality of role playing is inversely proportional to the number of people playing.

MMOGs and Storytelling

- MMOGs don't work well for storytelling.
 - We can't create unique heroic journeys (or political thrillers either) for 100,000 people.
- Almost nobody in them does role-playing.
 - They don't know how and most **don't care**.
 - The socializing is real, not virtual.
- They are immersive, but...
 - The immersion is strategic & tactical.
- They are FULL of spoilsports!
 - I can't achieve narrative immersion there.
 - There are no rules to reinforce it.

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Immediate Challenges

- ### Animation
- **Our graphics look great – until they move!**
 - People move like marionettes.
 - Masses not properly modeled.
 - Interactions with the environment are poor.
 - Interactions with other people are poor.
 - **We need inverse kinematics**
 - Correct interactions with the environment
 - **We need true locomotion**
 - Properly models the behavior of bodies
 - **We need more research on the physics of non-rigid bodies.**
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- ### Artificial Intelligence Research
- **Credible artificially intelligent people**
 - **Voice recognition**
 - Must accept all sorts of people, without any training.
 - **Computer-generated speech**
 - Must also create a sense of the character and personality of the speaker.
 - Recorded fragments can only go so far.
 - **Natural language comprehension**
 - **Natural language generation**
 - **(AI has proven incredibly resistant to hardware improvements.)**
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- ### Procedural Content Generation
- **Development costs and time keep going up.**
 - **PCG may help reduce some of this.**
 - **Pre-rendered PCG**
 - Allows artists to hand-edit the results after generation.
 - **On-the-fly PCG**
 - Requires a lot of CPU power.
 - Use the graphics hardware, not the main CPU.
 - Requires heuristics to avoid generating nonsense.
 - Must use pseudo-random sequences so a given object looks the same every time it is generated (but what if it gets damaged?).
 - Good for unimportant objects that fit a pattern, e.g trees.
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Recognition as an Art Form Requires:

- An **aesthetic** for judging and a **vocabulary** for discussing interactive artworks
- Serious **criticism** by well-educated people
 - (Not just “game reviews” by teenagers.)
- Academic **study** of the medium
- Highly-publicized, well-respected **awards**
- A cult of **personality** à la film directors
 - Art requires an artist – someone for people to admire

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So What’s the Future Role of VR?

- VR technology may be better for gaming than for linear fiction. Especially role-playing games.
- Its greatest benefit is *not* that it presents worlds to the player that seem real.
 - We can already do this pretty well.
- Its greatest benefit is that it lets the player present himself to the world as other than he is.
 - The mask is a dramatic tool going back to the Greeks.
 - Players love to customize their avatars, female players especially.
 - VR would be a great help to serious role-players.
- Perhaps Virtual Reality should be renamed
 “**Augmented Selfhood.**”

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Conclusion

No other form of interactive entertainment tries to be all things to all players.

It’s time to stop apologizing for not working miracles.

VR Interactive Drama can be great...
but it is only as good as the players.

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Letting the Audience Onto the Stage
The Potential of VR Drama

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