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PROFESSOR: Today I've got quite a lot of stuff to go through. So hopefully we'll get to the actual game playing, but if not, don't worry, you'll actually get to play the games-- the games that we'll end up playing today are games from last year. A lot of them are actually the final semester-- the final project, which means they are not answering the same question that you're trying to answer with your very first project.

But it should give you a sense of what the scope of this class actually is. Last week, a couple of you played the LEGO game, Block Party. That was a two week project, and that was just without staff. These were more like four week projects. And we'll design my students with larger teams and probably closer to the kind of game that you're going to end up making.

I want you to keep in mind that you're not constrained to building games that look exactly like those. In fact, after you've got a chance to play some of the games from last year, I hope you actually have a chance to think a little bit about what did they not do. All these games are like this sort of board game. And you will see a lot of them are this sort of board game. You find out what this is.

And you'll be able to do-- you can think a little bit about what would it be like to design a game that's not that. What if you just wanted to make your car game, for instance? You can. That's no reason why you couldn't. What if you want to do a live action game where you actually move around with your body, that sort of thing? That's totally doable.

I really, really hesitate not-- try not to put any live digital components in your game. I know some people-- unless it's something simple like a timer that you can run off your iPhone. OK, maybe that's fine. By actually writing code, then the scope of this project just went through what I expected you to do. And the possibility of failure is-- go back please.

AUDIENCE: Very much.

PROFESSOR: But not failing the class. But your project just failing during runtime. So that's probably something you don't necessarily want to do. We had two readings today, one for last Wednesday and then one for today. So I want to-- I try to cover quite a bit of it from the first reading during class itself. Was anyone here not here on Wednesday? OK, all right.

So we need to make sure that your name's on the attendance sheet. And you should come and talk to me after class. And we'll make sure you get a copy of the syllabus and everything like that. Make sure that you get expectations for this class. Everybody who was here, hopefully you found your name on the attendance sheet because I had to manually add a few of you. So I hope you got-- I got it all right.

Now one of the points that I try to get across-- is this recording? Yeah. One of the points that I tried to get across on Wednesday was-- all right, who's the most important person when it comes to actually playing a game?

AUDIENCE: (COLLECTIVELY) The players.

PROFESSOR: The players, right, not the designers, not you. But you when you actually play someone else's game. Then you're the most important person. If that person's experience is problematic or exciting or engaged or outright hostile to other players, or something like that, that's making it the way that they want to take it. And then you as the designer are going to run through a number of different challenges trying to be able to give them an experience that you're trying to create for them.

But you also have to acknowledge that if somebody wants to take your hardcore strategy game and turn it into a lighthearted party game, or vice versa, that's their prerogative. And if they say, hey, I really, really wanted this to be a lighthearted game, and you gave me this hardcore game. And it made me hate the people around me, the table. And I don't like it, that is fine.

It's OK for them to not like your game based on my criteria like that. However, one of the things that comes up in the Brathwaite reading is this concept of meaningful decisions, right? Well, what's-- Sid Meire how many of you heard of Sid Meier? Yeah, what games can people remember from--

AUDIENCE: (COLLECTIVELY) Civilization.

PROFESSOR: OK, Civilization. Railroads? I think he also did the first Rollercoaster. Pirates? Yeah, yeah. Mostly a computer game designer, although if you actually play his games, if you like digital board games a lot, especially Civilization. And he has a code, which just says games are a series of interesting decisions. Not necessarily meaningful but interesting-- the decisions.

And what are some of the ways that a decision can be meaningful? What are some of the things that might come up in the reading or occur to you right now? That a decision in a game can be meaningful-- what does it mean? What does it mean to be meaningful? Couple hands?

AUDIENCE: When you make that decision, the game's status changes or code that meanders the change?

PROFESSOR: OK, so when you make a decision, and then the outcome actually has changed. So the corollary is that if you make a decision and the outcome hasn't changed, it wouldn't terribly be meaningful. OK?

AUDIENCE: That's what I was going to say. I guess a lot like doing something and, I don't know, getting money in a money based game.

PROFESSOR: So getting money? So getting some sort of quantitative reward based on the decision that you've made.

AUDIENCE: Also you can get sort of awesomeness award even if it doesn't affect who will win or not. It could be something really awesome in the game, and you make a decision--

PROFESSOR: So kudos or something like that. It's like, wow, that was an amazing-- like in football, for instance. That was an amazing play. It didn't necessarily complete, but it would have been awesome. But maybe it was an awesome defense or something like that. That could be a meaningful decision.

How about if you decide to roll a die? Game state has changed, usually. Is that a meaningful thing?

AUDIENCE: It could be if it's like a choice you have. You roll a dice in one direction of the game or do you not, and choose different that's meaningful. It's like, do I roll the die now, or do I wait a minute before I take my turn. That's not really a meaningful decision.

PROFESSOR: OK, it's like, let me think about this. Then I'll roll it eventually. All right, someone's hand is up. I'm going to go this way.

AUDIENCE: So if you had meaningful alternatives as well?

PROFESSOR: OK, so again, if you had the choice not to roll the die, OK?

AUDIENCE: I would say most games that the die roll would be meaningful but not a decision. So the die roll basically tells you what to do. You're not actually thinking about it. But it's still meaningful. You can still change the game state and the fact who wins or whatever happens to me.

PROFESSOR: So the outcome of the die roll is usually meaningful, but you may not have had to decide to do that. (Starting with you, We'll go that way.)

AUDIENCE: To go with that. In a game like Yahtzee where-- do you roll the dice you're trying to make room. But it's about the die rolling where it's like something not Monopoly. It's not really a decision. You have to do it every turn.

PROFESSOR: Mm-hmm. Yeah, and that's an interesting thing. I talked a little bit about mechanics on Wednesday and the idea that if you think of a mechanic as something a player does to change the game state, the roll die-- the die rolling thing is a weird thing because game state is changing it's something a player does but a player didn't decide how to do that, right? The player is just told to roll this die.

AUDIENCE: Well, they kind of covered [INAUDIBLE].

PROFESSOR: OK, yeah that's good.

AUDIENCE: We can choose like a different type of roll.

PROFESSOR: Oh yeah, again like Yahtzee-- which die, right? Yeah?

AUDIENCE: I learned this definition of [INAUDIBLE] series decisions, like the card game War, for instance, or the board game Candy Land.

PROFESSOR: That's a version of Candy Land which lets you choose which pile of red cards to draw from. But is that meaningful? A stack of randomly shuffled cards?

AUDIENCE: Yeah, it has to do with [INAUDIBLE].

AUDIENCE: If there a random pile [INAUDIBLE].

AUDIENCE: If you shuffle them and take the top card, it's doesn't really matter.

AUDIENCE: But if you do Chance or Community Chest.

PROFESSOR: I feel you something else that you wanted to add on to that.

AUDIENCE: No, I was just going to say. It just means that these things aren't games. And--

AUDIENCE: It's seems okay actually.

PROFESSOR: The thing is that they might be games but that particular decision may not be the meaningful one. And it's possible that in the entire game, maybe you don't get that many meaningful decisions. That doesn't necessarily make it not a game. It might make it not a very good game, which is a different thing. That's a qualitative and often subjective experience, right?

To a two or three year-old it maybe an awesome game. You get to play in a land of candy. A few more hands I thought I saw?

AUDIENCE: Yeah, on that topic. I think there's a reason why people who over a certain age never really wanted to play Candy Land anymore because they realized that they don't really do anything, so they get really bored with it. For kids or some other targeted thing going on more than the meaningful decision, making it fun to actually just doing something and moving-- or winning cards that makes it fun.

PROFESSOR: The thing that war and Candy Land let you do-- if, for instance, it gives a five-year-old a winning chance against an adult, right? That could be huge for a kid. It's like, wow, I can actually play this with an adult? Learning how to take turns is one thing that people have actually get good at the games like Candy Land. I can't remember if I brought this up last time.

I believe Candy Land was invented to keep kids from getting polio from each other. That might be urban legend.

AUDIENCE: [INAUDIBLE]

PROFESSOR: Huh, it's true?

AUDIENCE: It keeps kids indoors.

PROFESSOR: Keeps kids indoors and try to get them from their--

AUDIENCE: --they're working with other kids. There's polio going around at the time it happened. If you stay indoors with the people you already know you know aren't infected, you're going to be OK.

PROFESSOR: So, OK, that was--

AUDIENCE: With polio, you can't do much of anything.

PROFESSOR: There's a huge inversion from the get out and get some exercise. It's a serious game. It has health benefits. Let's play in the land of Candy. I would like to go back a little bit to this idea about changing the game state, right? You make a decision in a game, and you've changed a game state. And it wasn't a decision-- it wasn't-- I get to try to roll from three identical dice. Which die do I roll, OK? All right, that's not real-- a real decision. Unless they are loaded and there not identical.

But anyway, so what do you need to be able to communicate to the player that their decision actually changed anything? OK, actually let me flip that around. If you don't let the player know what changed the game state, even though the game state might have changed, is it that meaningful a decision anymore?

You did something. Some numbers changed inside the system. It's good to affect how things go out later. But you don't actually know what happened. Has anyone played a game like this? Does that sound familiar?

AUDIENCE: I feel it's very much potential to player and the system because a lot of times something like that will happen and whatever most people say, oh, nothing really changed. My decision didn't matter at all. Whereas someone that takes the game more seriously might actually realize something changed just from probabilistic analysis, something ridiculous.

And also if you expect players to get very into your game, this is the stuff that you can leave with because they will understand it and figure it out on their own. And that has to be part of the game. Whereas if you expect players to pick it up and play it three times in their life and then move on, then it probably won't help them that much and you should you should probably give them more feedback socially.

PROFESSOR: Yep, some other hand?

AUDIENCE: I think, also, if you have an adventure game where there's a story or something. And you tell some guys to just not help the guy. And then he becomes an evil warlord later, there are some interesting things you can do with that.

PROFESSOR: There's a long term consequences, so a lot of immediate consequences. Immediate feedback, which is a term that you brought up.

AUDIENCE: Looking at-- there are certainly games where --to make an example. In Dominion, oftentimes you can draw cards that don't help you just pointlessly causing a reshuffle. But normally if I were to do this without thinking and thinking doesn't matter. Would it actually be slightly beneficial or slightly [INAUDIBLE] that actually do this? But unless you really think about it, you won't even notice that it caused any sort of change there.

Thinking of the Hitchhikers Guide to the Galaxy game wherein-- there's a specific point where you must-- if there's a dog, you need to give it a sandwich. Otherwise you're doing it yourself 200 turns later, like hours later in this game.

PROFESSOR: Right, and that hurts, right?

AUDIENCE: What's the game called?

AUDIENCE: The Hitchhiker's Guide to the Galaxy text adventure.

AUDIENCE: Another really straightforward example is competitive games where you get only some of the [? stateness ?] information, like *Starcraft* or something. You can't really see what your opponent is doing.

PROFESSOR: Yeah, it's interesting because usually not [INAUDIBLE] changing what your opponent does based on what you can't see. And I say usually because it does happen. Occasionally, your opponent sees something that you didn't see. And they changed their strategy based on that.

I've played a number of adventure games that actually have this more as a puzzle solving thing. So it's not like 200 turns later something changes. It's like something changes right away, and you need to figure out what changed. So it's not immediate feedback. There's feedback somewhere in the world. But I want to say I probably didn't enjoyed those games. Maybe someone does. Something-- Do you want to ask it?

AUDIENCE: Well, you have to be careful that it doesn't have too much complexity or some sort of unanticipated change that there's too steep of a learning curve to actually enjoy it, but you play it and it takes two hours. And you realize something you did, screwed you up, you might not want to play again.

PROFESSOR: Yeah, it's like--

AUDIENCE: [INAUDIBLE]

PROFESSOR: --I got the wrong ending because I made this decision five hours ago or something like that. OK, how about the alternative, when something-- my game state changes, and you're not really sure how your decision came up with that outcome. So not random exactly, but overly complex maybe.

AUDIENCE: Well, you don't end up with a good mental model of how the game works. And so even though you make meaningful decisions, you don't know what the meaning is. And so any time you're making another decision, you may be able to select, actually choose in a way that you want to.

PROFESSOR: Yep, OK, mhm.

AUDIENCE: It prevents a chess style of approaching the game. Right, in chess you see the board and you-- a lot of the really good players will see X number of moves in advance. But when things happen, they just randomly appear. You have to react on the fly. You can't just plan out all of your moves.

PROFESSOR: This-- reactive play.

AUDIENCE: I think this one's a lot bigger issue than the other one because this could lead to a lot of frustration with players. If they can see the game state changing and know that they're effective but don't know how they're affecting it, I just feel as a player, that would frustrate you to no end. And that would make you think that everything you do doesn't really matter and that you're going to win or lose regardless of what you're doing. And it kinda turns it into a Candy Land game even if it's not.

AUDIENCE: Mm-hmm, OK.

AUDIENCE: [INAUDIBLE] the game-- occasionally I've played some word [INAUDIBLE] games that are hard to understand. And the mechanics aren't intuitive like Village. We sort of did stuff, but we had-- and then afterwards, we didn't really understand. We didn't understand how we were changing it, but it took awhile before you really-- you don't understand what's happening.

And there are many games where you can do very poorly or very well. And it takes a while to understand exactly why you're doing very poorly or very well.

PROFESSOR: So sometimes even success can be bewildering, right. Yeah?

AUDIENCE: I feel like this sort of [INAUDIBLE]-- it's easier to deal with from a digital game and a board game because in a digital game, usually people have to take their turns and have to play out more slowly, whereas in a good board game, you change something and-- if you do something and something changes, maybe you can just start over and do it again like it's a different thing.

PROFESSOR: All right, hold on. So in a digital game?

AUDIENCE: Yeah, trial and error.

PROFESSOR: OK, so in a digital game, because some games let you save state and then reload state. So you can say, well, what if I tried this decision? And then there's an interesting phenomenon that goes with that in a lot of strategy games called save scrubbing. And that is where you know that the outcome of something is based on a probability. And so if you save and reload often enough, you will always be successful.

And that's an interesting strategy. This is completely aside from what I wanted talked about today. But it's an interesting strategy that game designers use. And that is to-- in a digital game, save some random number seed at the time when the save is made so that outcome's always the same.

I expect tech support calls when people when you implement that, though, because people are like this-- your random number is broken. I tried this thing 15 times. And it's supposed to have a 90% success rate. And I always fail when I do this one attack. And it's like, yes, because you saved the random number seed.

So that is actually a problem because people have this concept about how the mechanics of what does 90% probability of success mean? And I am specifically thinking of XCOM right now. If anyone wants to play that. 90% probability of success to a lot of people means that most-- means that it's going to succeed. Now for a lot of people, probably a lot of people in this room, this means you will probably succeed.

But for a game whose pushed the random number seed has been saved and you fail and then you reload from the start, it means you will always fail because that's a different concept of how the random number generator works. It makes a lot of sense to people who are game designers or computer scientists but may not make a lot of sense to a lot of players.

I get to re-roll again when I save in those, right? But now you get to re-roll exactly the same time, exactly the same way, which means you've got to come. So this brings me to the second reading, which is Don Norman's first chapter in the design of everyday things. The book used to be called *The Psychology of Everyday Things*, which had a nice little acronym him of POET.

But then people had trouble finding the book because he was looking for design books. And it was shelved in the psychology section. So he changed the name to *The Design of Everyday Things*, which I think is a really interesting application of the kinds of things that he's talking about. Do you expect to find this book somewhere and is not in that section? So you make a change and you iterate on it. And if you look at the copyright, it actually still *Psychology of Everyday Things*.

He talks about visibility. And what does visibility do in a syst-- in a design?

AUDIENCE: It helps people understand the qualities of what they're doing or what they want to accomplish.

PROFESSOR: Yeah, they have an intent, right? They want to accomplish something. And it gives them a clue on what they could do to accomplish that. So already, that's a direct application to games, right? You have a goal in mind. It's like I want to accumulate more cash in this game. I want to-- I'll produce my opponent or something like that.

All right, what are all the things that I can do? What's telling me might-- what's in front of me right now? Maybe in a board game, maybe in a card game, maybe in a visual game, that's telling me visibly, right now, that this might be the way I get to do that. In a lot of strategy games, some of these things are very literal, right?

So and so technology gives you this bonus. It's very-- I guess a little of the role playing games also have this, right? I want to hit things harder. Oh, look, this thing just needs plus one to attack. All right, OK, that that's a very literal thing now. How much effort you need to do, you need to go through to actually find that piece of information and whether plus one is actually a meaningful difference at all. It's depending on the design of the game.

But visibility has something to do with the intent of the player of the user in Norman's case. But he's not talking about games. He's talking about the design of everything. And what the system can actually do, the actual operations of the system. So I'm playing a game like-- I'm playing a real time strategy game, and I have a tank. And I want to make it do doughnuts.

And it's like, well, the system doesn't actually support that. There's no physics simulations to this tank. So I need to be able to convey to the player that this is not something you can actually do in the game. You can tell which hex to move your tank, but that's it. Maybe the tank doesn't even turn, right?

So the other thing is this concept of mapping, that there is this-- again, it has to do with the player's intent of what they want to do, what they want to accomplish. But mapping, instead of the actual operations of the system, actually has to do it for what you can see of the system. So there are affordances and there are constraints. These are both words that are introduced in that reading. I think affordances is introduced in this reading.

What's an example of an affordance?

AUDIENCE: If you can sit on a chair?

PROFESSOR: You can sit on a chair? What about this thing tells you that you can sit on it?

AUDIENCE: It seems sturdy, and it's got a place for your butt.

PROFESSOR: Yeah, it's got a nice little butt-shaped thing, here right? It's not made of spikes. It's got at least three legs, which may help, and evenly distributed, which means that it's not going to tip over.

AUDIENCE: You can also measure it related to other objects to [INAUDIBLE] also. And that you--

PROFESSOR: OK, there's a little bit of cultural familiarity with other chairs that you've seen.

AUDIENCE: What about a handle on a door?

PROFESSOR: A handle on a door. What does a handle on a door allow you to do?

AUDIENCE: It's like-- it's a place for your hand.

PROFESSOR: It's hand-shaped. It's--

AUDIENCE: If you hold your hand out in a natural way, you grab-- looking at the text. Oh, I wasn't thinking of that handle. I was thinking of the vertical type of handle.

AUDIENCE: The one that looks like a U-shaped tube-- like that.

AUDIENCE: Yeah, exactly.

PROFESSOR: So yeah, it's kind the right shape. It's one of those door handles or something like the size of a supporting column. You wouldn't necessarily think that you had to grab it, right?

AUDIENCE: An outlet is for sticking things into. You can see these holes thing.

PROFESSOR: Like fingers?

AUDIENCE: They're not finger-shaped.

PROFESSOR: Because they're not finger-shaped. Yeah, although it has a kind of weird happy face on it, which I always thought was a little bit strange about-- that might have been designed, too, actually. That might have something because if you-- this won't kill you, really. So you should put it in your home. I want to find out more about the history of the Edison plug.

AUDIENCE: It's actually-- the design with the ground on the bottom is a bad idea because if something starts falling out that are too exposed to it, it will not be the ground one. So it would be better to flip it.

PROFESSOR: Where's the ground in the mid- up top?

AUDIENCE: Yeah, because then even if it starts coming out a little, then something falls down between the--

PROFESSOR: So it's bad design. It's bad design because you want to put it on your wall in a way that it smiles at you all the time. But when it's the other way around, it's actually a little more stable. It's actually like a mo-- British plugs, actually, have the pin usually on top and--

AUDIENCE: The British just have the eyes [INAUDIBLE] pin. There's [INAUDIBLE]. Right?

PROFESSOR: That would be the-- what would it be?

AUDIENCE: [INAUDIBLE]

AUDIENCE: For two round circles.

PROFESSOR: Yeah, yeah, the two round circles, yeah.

AUDIENCE: They're using--

PROFESSOR: Dan, I think you're thinking of your pins, which are round. The original size is flat. But they are twice the width of the thing. You could stick your finger in a British pin, which means they have to design all kinds of protection mechanisms, plastic springs, and things like that, just to be able to prevent you from sticking your finger in it.

It does have-- yeah, this one's actually nice because the biggest hole in there is the lethal hole in there, is the one that doesn't have any current running through it. So an affordance is something which suggests this is how you can use it, right? Something that you can get hand around suggests you can grab it. Something with a movable hinge suggests that's the direction that you move it in.

So they talk about materials like wood and glass, right? Glass is for looking through. Glass is for smashing. Wood is for holding things together. And wood is possibly for writing. You've got this porous material. It paints very easily, that sort of thing. And in games-- let me just bring in an example.

Let's try to identify the components of-- how many of you have played put before? Really, really-- this is the box. Let's talk about things in here that's a rule sheet. I guess it affords reading, but I'm not going to talk about. It has this thing. Actually, what you do with this thing?

AUDIENCE: Ring it.

PROFESSOR: Slap?

[BELL RING]

Yeah, that's what it does. OK, all right, so now that you've seen what this thing does. What is one of the things that this-- not in the rule book Pit completely. If you have this in your game, what is this thing good for?

AUDIENCE: Getting attention.

PROFESSOR: Getting attention, yeah. It's loud.

AUDIENCE: Annoying people?

PROFESSOR: Annoying people. You could use it to annoy people. It's like-- you want to lock out what they're trying to say or something and just keep hitting it.

AUDIENCE: Signalling that you're the one that completed the objective.

AUDIENCE: [INAUDIBLE]

PROFESSOR: OK, yeah, so the completion of something, the end of-- because it's very percussive, right? It's not just a loud-- like an air horn. It goes eh. This one actually has--

[BELL RING]

--very, very sharp [INAUDIBLE] sound. What else? What else about this?

AUDIENCE: It's shiny.

PROFESSOR: It is shiny. Makes you want it, right?

AUDIENCE: You can hold it in your hand. And so you might be able to conceivably pass it around.

PROFESSOR: You could pass it around. This could be controlled by different people. It doesn't necessarily-- it's not a huge thing for anyone.

AUDIENCE: There's only one of them.

PROFESSOR: There's only one. If you only had one, so then that becomes even more desirable because it's the only--

[LAUGHING]

AUDIENCE: Seriously.

AUDIENCE: Nice.

PROFESSOR: Something that may might be able to stand nicely on a flat surface. But it's not rubberised or anything of that. So if you put it on an incline surface or something like that, it won't stop sliding. So this implies that it's going to sit on a table somewhere. It also comes with a bunch of cards.

Ooh, whoa. What happened to these cards? Good Lord. OK, now the paint could rubbed off or something that. So don't worry too much about the text and the graphics. But just look at the card. What do cards allow you to do? What are the affordances of cards? Hm?

AUDIENCE: You can hold a couple of them in your hand.

PROFESSOR: You can hold a couple of them in your hand at once, OK.

AUDIENCE: Concealing. Because there's two sides.

PROFESSOR: Yeah, there's a side that you can put no useful information on, right? Besides the brand of the game, sure. But all identical, so you don't know what it is.

AUDIENCE: Collect. You can have a bunch stack onto each other.

PROFESSOR: You can hold a lot of them in your hand at once. What else? What else about this?

AUDIENCE: Pattern recognition is really easy.

PROFESSOR: The way how they've been designed makes it possible for you to do pattern recognition. Something which they didn't do is use different colors, which might make it even easier, at least for people who are not colorblind. But they've arranged similar elements in the same place. And they didn't use colors to denote the numbers. What else about these cards?

AUDIENCE: Just cards in general-- you can exchange them.

PROFESSOR: Yeah, I guess that's up to you. And in fact, Pit does that. Pit's one of those games where exchange is a real time thing. We're probably play it later in the semester because it's so light. And so easy. Yeah?

AUDIENCE: It's easy to have a deck and then draw from it.

PROFESSOR: Oh yeah, you can have this randomizing thing where you just have a whole stack sitting on the table. And then you don't know what you're going to get. And you just grab one. Amazingly, it's actually pretty easy to just grab one as opposed to five at the time.

AUDIENCE: It's easy to mix them up too if there was a really good random aspect to the game.

PROFESSOR: Because of this? Because of shuffling? Yeah. Or 52-card pickup. It fits in a hand. It's a little bit smaller than it needs to be in order for you to hold it comfortably like that. But these particular cards are a very, very good size for shuffling.

AUDIENCE: They're black. You can put them on tables.

PROFESSOR: You can put them on things like tables, yeah. You can deal them. You can flip them upwards and downwards, sure.

AUDIENCE: It's also the fact that then you have to put either face down or face up, you can't really place them on their side.

AUDIENCE: Yeah, they're really terrible for building things out of. It's possible but really hard to make something, to make a card stand up. So it makes it really obvious that it's either this or this. Other orientations other than that face up or face down aren't really considered, aren't really part of the game.

AUDIENCE: I was going to say that they're rectangular?

PROFESSOR: Yep.

AUDIENCE: So going back to the point of orientation, maybe they're vertical and horizontal--

PROFESSOR: Mm-hmm, it's a [? tap ?]-- the path it [? tap ?].

AUDIENCE: It'd be hard to do with a square or circle card, but a regular shape, an elongated shape.

PROFESSOR: Conversely, a square card could afford full rotation in any direction, rotation. We'll get that, actually, in the next one where you can just rotate things around.

AUDIENCE: Stiffness and shininess of them distinguishes them from stacks. In some games you have papers that you write on them that are disposable. Pass a paper.

PROFESSOR: This is supposed to last a little bit of time. Multiple play sessions at least. So yeah, a bunch of things that cards do are already that you've identified which are all very accurate. And that's a lot. Cards do a lot. And when you're designing a game, you need to think about whether cards are the right thing for your choice, for your game. And you've gone through a pretty deep analysis about what this thing does that might make it appropriate.

Something that might be a little subtle-- the rounded corners actually make it much easier for you to do things like this. If it wasn't around the corner, it's actually pretty uncomfortable to do a fan. It's not like you couldn't. You totally could. There are stationary stores actually do sell punches, corner punches around of your cards. It is not something that I would actually recommend that you do during prototyping because it takes too damn much time.

But if you were to design a game for home, for your family, or something like that, and you want to make it a pleasant experience. You might just want to spend \$2 on a punch and just punch the corners out. It's really, really hard to do it consistently when using your hands, by the way. So it could take away the whole information hiding things. But oh, the one that was badly punched, that's the joker.

Let's see. That's, oh, that's next. Let's see what else I talk about? So mapping, so back to the idea of mapping. You've got your intent. Here is something that you want to do as a player, maybe hide information from other people. And then there's the affordances of the system. Now if I wanted to hide my cards from you, then I will hold my cards in a way that only you can only see the side that doesn't reveal any useful information.

So that's a very, very direct, clear what he calls natural mapping, although I am not quite sure that phrase is very easy to use in practice. It gets a little bit more complicated when you actually look at the system that the game is trying to reproduce, right? So far I've just been talking about cards. I haven't been talking about what the rules of the game are.

How many people play Carcassonne? OK, a couple of people. We should be able to get a chance to play this later this semester. I'm pretty sure it's already in the syllabus. So there are a couple of things in this game that is this board. There's a back of the board, which is not colored. And it has a design on it. We could just pass this one around.

It's got little playing pieces that are referred to as meeples by the hardcover board game fact base, I guess. They look like little people. Actually, there's probably enough in that for everyone to grab one or two. And then you can just take a look. I want them all back, but you can take a look at them.

Whoops, and a bunch of tiles that I will also hand out. I'll hand out half to that table.

AUDIENCE: Something you can look at. [INAUDIBLE].

PROFESSOR: Just take a look at the pieces, and let's start with the tiles. Some of you have gotten just the meeples. Some of you have gotten the tiles. What do the tiles suggest, just by looking at them?

AUDIENCE: [INAUDIBLE]. Terrain?

PROFESSOR: Terrain, all right, something to do with land. What else?

AUDIENCE: The various terrain features seem to match up.

PROFESSOR: The various terrain features such as the--

AUDIENCE: --rivers and roads. You can match up.

PROFESSOR: Yeah, they line up nicely when you put the tiles in a grid with other tiles, right? Yeah, there was a hand back in the back room? No?

AUDIENCE: You can rotate them.

PROFESSOR: Yeah you could ro--

AUDIENCE: Squares.

PROFESSOR: Yeah, squares, because unlike the cards, which is taller and than it is wide or wider than it is tall. This one is the same length-- more or less the same size from all directions. So the idea is that maybe you could freely, just freely rotate these things.

AUDIENCE: They're identical with a back.

PROFESSOR: They are all identical with a back? And that tells us about these tiles, something that we already know about cards.

AUDIENCE: You want to hide the information.

PROFESSOR: You want to hide the information?

AUDIENCE: Or.

PROFESSOR: Or--

AUDIENCE: [INAUDIBLE]

PROFESSOR: Or you want to shuffle it, yeah. The fact that you've got a hidden back gives you quite a lot of different possibilities. This rule-- this game in particular uses mostly because of this shuffling and this randomization. You don't know what tile you're going to draw. So for people who haven't played this game, and you're looking at all these tiles, what do you think you do with these tiles?

AUDIENCE: You match them up [INAUDIBLE] on them?

PROFESSOR: Congratulations, that's Carcassonne. You figured out the game. You match things. You make big things. You put people on them. That track that's going around, the board that's going around, I've got one that is probably a little bit less insightful for this particular lecture. Anyone want to guess what that is, someone who hasn't played the game?

AUDIENCE: [INAUDIBLE]

PROFESSOR: You haven't played the game, right?

AUDIENCE: Yeah, I've played some other games, but it's probably just a scoreboard or something.

PROFESSOR: There's a scoreboard.

AUDIENCE: You do something to move you along the path somehow. And then the first person to reach it probably wins.

PROFESSOR: Yep, OK, good. Well, yeah?

AUDIENCE: Well, it looks like it connects back. So it makes me think that maybe instead of winning by just getting around, maybe every loop, you get a new tile or something like that.

PROFESSOR: OK, it keeps going on and on. It's a combination of all three. It is a scorecard. If you loop around, I think it means that you've got 100 points or 50 points. So you just add 50 to your score every time that you go around. And what fits on those things? What would you place on that board?

AUDIENCE: The little people?

PROFESSOR: The meeples. You place the meeples. You place the meeples on the tiles. You place the meeples on the board. You wouldn't place a tile on that board because there's no hexes there. So you've already got a mapping of probably what intent that you've got. Let's make some big things and put our people on them.

And the affordances of what you can do with these tiles that suggested that to you. This is a game about making large patches of similar things and then putting people on them. Oh, my notes are over here. Why does that keep coming on. I keep giving private information.

PROFESSOR: I'm sorry you keep being close to my family photographs. So there's a whole bunch of ways that you can help people with these sorts of mappings. We've been talking a lot of visual and physical. I guess Donald Norman would describe a lot of these as spatial, metaphors to use. Spatial mostly to describe things like driving in a car and you turn the wheel to the left specifically toward the top of the wheel to the left. And your car it's directed to turn left, that sort of thing.

There are sort of bodily metaphors as well. Things that are high are either supposed to be good and happy, things that are low when you're feeling depressed. And you can't pick yourself off the ground, making you sad or bad. A lot of these metaphors are actually arbitrary. A lot of us have learned them through culture and socialization in a world. But that means that these might be things that you can play off.

And we're going to do a little bit more detail. I'll give you a couple of more examples in about two weeks when we revisit the idea of user design. He talks about things like single control, single function where if you've got something that does something, you might not want to make it do yet another thing on top of it because that starts to get really, really confusing. The meeples, for instance, yeah you place them on the map, but you also place them on the scoreboard.

I personally think this game will be a little bit easier to learn if they just gave you a different piece for the scoreboard that was the meeple-- the same colors, just a slightly different piece-- because pieces never move from the scoreboard to the tiles or back. The other thing that I want to talk about is what do these tiles not let you do?

Well, they did let you do that. But was it easy?

AUDIENCE: No.

PROFESSOR: No, OK, all right. They're also not very good building materials, just like cards aren't.

AUDIENCE: Holding them is kind of hard.

PROFESSOR: Holding a whole bunch of them is hard. They're really thick. And you saw the difficulty I had just trying to pull half of them out of the box. They were unwieldy.

AUDIENCE: Shuffling.

PROFESSOR: Shuffling's tough. You can-- all right, maybe I'll do this once a game.

AUDIENCE: Put them in a bag maybe?

PROFESSOR: Hm? If you had them in a bag, yes. A bag is its own affordance, right? It affords its own like me picking Scrabble, for instance. How then Scrabble was really, really well in a bag. So if you wanted to randomize things, yeah, you could totally just put the whole back hiding thing and just put them all into a bag and then just pull one out of random.

So these are constraints. You're not really supposed to have more than one tile at a time in Carcassonne. You are supposed to draw one, figure out where it goes, put it down. You're not supposed to ever hang on to two. So it's OK that the tiles are designed in such a way that it makes it hard for you to hold on to do. For the cards, for instance, you're not really supposed to stack them.

They are not very useful to you when you've got them face down because you can't really see the information. To get a small number of cards, like in poker or something like that, maybe you could remember what you had face down. But if it's a large number of cards, like in Pit, you really want them held face up, facing you.

So the idea of-- in Pit, you don't really ever put that face down. I think there might be a rule about placing them face down right at the end of the game. But you don't actually-- no, that's not even true. You don't ever have to place them face down. When they're face down, they're not interesting to you. You should have had that information in a minute.

So these are constraints. These are things-- this is another way that the visibility of the system can help you with those mappings. You're looking at the system and the pieces that it's giving you, and you're thinking, what can't I do with these things? And that's probably not what the game wants you to do with these things if the game is designed well. Games can be designed poorly. That's a caveat. Everything that I say is a qualitative, subjective statement.

And that goes back to something that was brought up earlier about mental models, right? As you play around with these pieces-- of course when you read the rules and you see the illustrations, maybe when they read it at the back of the box, I would suggest that usually you start trying to figure out what a game is when you pick it up off the shell and you start looking at it.

And it says, hey, this is a game that I want to play. It says Deluxe Pit, over 100 years of-- 100 years of card game fun, geez 100 years. The front says 1904. So this is probably not a science fiction game, all right? Actually, for people who haven't played this game, what do you think this is about? I don't think I've talked about it.

AUDIENCE: Maybe about the stock market or something. There's a bowl on it.

PROFESSOR: There's a bowl on it.

AUDIENCE: There's a trading pit maybe.

PROFESSOR: Yeah, the title of the game suggests things. It isn't like a commodity trading game. On the side, it says, "Corner the Market."

AUDIENCE: And it's got a bell.

PROFESSOR: I wonder whether they included the bell and over 100 years of card game fun intentionally. This is like, this game back in the time when stock market are run with bells. I guess they still are but mostly just run with computers nowadays. I'd love to see Pit done on some sort of updated 21st century thing.

AUDIENCE: [INAUDIBLE] with insider trading.

PROFESSOR: So there are, of course, the text at a back that tells you not only what the theme of this game is. Shout your deal and trade your cards to corner the market, et cetera. And then it also says, family age seven plus, 30 minutes, three to eight players, just to tell-- to give you a better idea. And when you look at this thing, I'm immediately forming a mental model of how is this game plays.

You know that you're supposed to collect cards because they show you a whole bunch of cards. You know you're supposed to slam a bell at some point in time. And then you're just reading the rules. All right, so when do I do this? It's pretty easy. Let's see. When it comes to Carcassonne, there is actually a deep, deep problem with this game despite how popular it is.

And that scoring is actually pretty difficult to do. It's a math intensive problem. It does largely map on to how many of the meeples that you have of your own color on large patches of things. But how much those things are worth, those patches of things are worth, requires a lot of counting, a lot of counting. And that's why you need a scoring track. So that is a big problem with that game on how the mapping works.

It doesn't really give you a good idea or a good conceptual model of how much something is worth. But you've got a large patch of thing. You've got your dude somewhere in there. You can at least make the mapping. That's worth something. And then that's-- the feedback that you get back from games when it's Pit-- the feedback that you get when you hit the bell, right? There's a huge ding sound.

That's the feedback that you get when you try to fit a piece that doesn't fit into something else. And there's a couple of board games where you have to put pieces together, and that gives you an idea of maybe those two pieces don't go together. What other things look for in the realm of feedback when it comes to board games?

AUDIENCE: Maybe a track?

PROFESSOR: Hm? You mean a board track?

AUDIENCE: Yeah, you want to stay on the track.

PROFESSOR: OK, all right, that's-- actually there are games where the only legitimate places that you can put your pieces can be is literally on the pieces that they provided you. So if you fall out of it, you are no longer-- that's not a legal place for you to place your token.

AUDIENCE: So it depends on the game. But for a very easy example, in a game like Risk would have-- you can very quickly look at the board and say who has the most soldiers. It doesn't necessarily mean anything but it's a good indicator. Just something like that would usually be nice to see you just quickly look at it and say, oh, this person's winning for this reason.

PROFESSOR: So the sheer quantity of similarly colored things.

AUDIENCE: Yeah, it doesn't even have to be [INAUDIBLE]. In Monopoly, if you look at the board, whoever has the most houses. [INAUDIBLE]

AUDIENCE: Similarly, in Catan, you can see if somebody has massive roads or a lot of settlements or cities, you can usually tell that they're doing pretty well.

PROFESSOR: Mm-hmm, that's, again, direct visual metaphor. And, of course, in that game, you earn points by having the longest road to emphasize it's a good thing even though it's already a good thing to have in game. What else?

Other players can give you feedback, right? If people remember playing Code 7 7 last week, there's information that other players can provide you that you need. But other players have to provide you. So what other games can you think of where other players are your primary feedback mechanism on whether you've done a move that's OK or not?

AUDIENCE: Mound Builders?

PROFESSOR: Mound?

AUDIENCE: The only feedback you get.

PROFESSOR: It is the only feedback you get, OK.

AUDIENCE: Poker?

PROFESSOR: Poker? Did--

AUDIENCE: If you make a bet that is-- say you're bluffing and you make a bet that is good, you know when everyone else folds.

PROFESSOR: OK, yeah, for a certain kind of bad, it's like, I won it. Everyone folds, and it's like, wait what. I had a royal flush. Why'd you-- That was a bad idea, right? OK, that gives you some sort of feedback for a very specific kind of thing.

AUDIENCE: [INAUDIBLE]

PROFESSOR: Oh, yeah. You stick a card with something written on it.

AUDIENCE: Yeah, and particularly based on [INAUDIBLE].

PROFESSOR: Mm-hmm, again, it's like Code 7 7. Everything that you know about the thing that you are trying to guess is something that only other people can see.

AUDIENCE: The game Mafia. All the feedback is filtered through the hosts.

PROFESSOR: And both useful and possibly confusing feedback, right? So yeah, all the information you're getting in the game is through other people in Mafia.

AUDIENCE: Battleship?

PROFESSOR: Battleship? Yeah, there's again the hidden-- information that's hidden from you, but it's completely available to your opponent and vice versa. And you don't need me to tell you the mechanics to tell you that. There is a computer battleship. It's not as fun.

Charades and Pictionary-- usually your teammates are the ones who are guessing. So I wouldn't necessarily call that feedback because it might be good feedback on whether your clues are getting across to your teammate. But your opponents are also usually some sort of feedback mechanism that's keeping time, that's keeping an eye out for or listening for illegal things, like if you said something very Pictionary.

If they hear you say something, they go ah, ah, ah. You can do that. And are there a few more hands or something like that? So just always remember that you can employ other players into your feedback mechanism. It doesn't always have to be your game alone.

AUDIENCE: There is a game I played a long time ago called Scotland Yard. The player positions is almost never known. You get some feedback about what he's doing, sort of what he's doing. You have that in terms of the information the gamestate that's hidden from you, feedback on whether or not you have achieved your objectives from the player that knows the information.

PROFESSOR: Yeah, I think it's like something like four or five detectives chasing one fugitive going through London's mass transit system basically-- buses, cabs, underground, yeah. And the person who's running knows where they're going at any given time. The detectives are working on partial information to try to corner and close this dragnet.

So I think that's on the list. Do you remember it? That was on the syllabus. It used to be-- Scotland Yard.

AUDIENCE: I'll double check it, I think I saw it. But we may have changed the game--

PROFESSOR: Yeah, so we might get a chance to play that. But that also falls in mastermind category of games where it's like, here's this person with all the information, only that person is changing the information as the game goes on. That's a big difference in Scotland.

AUDIENCE: Did remove it this year-- but we do have a copy.

PROFESSOR: OK, maybe we'll bring it in. It is a good game. So one of the things that Donald Norman ends his very first chapter on is that why is it so hard to-- he asks this question. OK, we've gone through this huge list of things in his book, including things like light switches-- well, actually, he hasn't talked about light switches yet. He will talk about light switches, something like that.

He talks about cars. He talks about doors. He talks about clocks. And he asked this question-- why is it so hard to actually make something right? Anyone remember? Or anyone thinking of--

AUDIENCE: Doesn't the designer never really communicates one-to-one with the user? They're communicating through the object that either was designed or being used?

PROFESSOR: That is definitely true. It is a second order problem. You're designing something that then becomes this manifestation that somebody else uses. And that's actually when all the problems occur. You first, then.

AUDIENCE: Well, he was talking about how like at first when something is invented. At first it's very complicated, and then your iteration comes up with something very simple. But then people want more functions. And they start this whole process over again where you keep adding new things. But it becomes less and less intuitive.

PROFESSOR: Market forces push you to add things, to do additive design in order to distinguish yourself from the competition. And that naturally leads to complexity in interface.

AUDIENCE: And a lot of products, you said, don't get through that process because it'll take five or six times to get it right. But if it's not good by the second time, people just won't buy it.

PROFESSOR: Yep, so get back to iteration. Five or six times means five or six times at the same problem, right? So iteration is the reason why design starts off as being very clunky. But it can eventually become something that works well, communicates well, or something that people can learn and maybe even enjoy in the case of the games.

One thing that's funny about the book is that it talks a little bit about the clock radio that could do-- make phone calls, and be used as a desk lamp, and keep track of your appointments, and used as a TV. And I'm still thinking, this isn't that this, right? Exactly the same thing they he's describing. And it's interesting because he described a phone that can only be used with two buttons, right?

Here's a button. And then here's a huge button. You get to select things. And it's exactly what he's talking about only, I doubt that actually imagined that this was something to be possible at the time when he wrote it. That was 1980. It wasn't that long ago.

And cell phones obviously have gone through a lot of criticism. iPhone, of course, has a lot of criticism because people who criticize it for being a lock-down system where you can't really do all that much. It's certainly not as customizable as Android system. It's expensive for what it does. But then, arguably, by locking out a lot of things that you might want to do but maybe don't have to do, they are trying to make it easier for you not to do the wrong thing.

So depending on-- there are different ways to fall on this camp. But it is it has been successful through a number of different reasons. Don't discount marketing as being something that the does sell. But what I want you to think about now is actually the process of prototyping. Actually you know what, I'm not going to go right into prototyping because they will probably make more sense once I've actually got the prototyping materials out.

What I am going to do is to give everyone a five minute break. We're actually going to come back and play some of last year's games because I think there's enough time for it now for about an hour. And then the last hour of class, what I'm going to do is I'm going to go into brainstorming. So then you can start forming your teams, thinking about what kind of game that you want. Prototyping might be something we'll leave up to Wednesday. So that there'll be a little more time for you to work in your teams.

So I'd like to get all the Carcassonne bits back. So and then we'll pick this up in about five minutes.