MITOCW | watch?v=DD0VDr65wmo

The following content is provided under a Creative Commons license. Your support will help MIT OpenCourseWare continue to offer high quality educational resources for free. To make a donation, or to view additional materials from hundreds of MIT courses, visit MIT OpenCourseWare at ocw.mit.edu.

- MARK HARVEY: We have Neil Leonard with us again. You all heard the great concert we had on Wednesday. So we thought we'd start out just by asking if anybody had any questions or comments based or that, that you'd like to ask the performer while he's here.
- **AUDIENCE:** Did it go how you expected it to go?
- **NEIL LEONARD:** I was pleased with how it worked. I didn't really-- I wasn't really sure how it would all go. I kind of had the basic idea, but there was a lot of logistical stuff to do leading up to it. I was finishing a piece of the final piece we pay played. I'd finished that week, so I just had my mind full of details to take care of. But I was really pleased at how it went. And I also was really pleased because Robin, my collaborator, was very enthusiastic and wanted to do it again. And so, that's kind of like a goal. If I do something with a group of musicians, to reach the point where people would want to do it again.

Anybody else? I think last week I threatened to make everybody ask a question.

- AUDIENCE: Usually I feel like a lot of the technology that people use detracts from the performance, but I felt like, definitely, in this performance it added a lot of value to what the audience was hearing.
- NEIL LEONARD: How so?
- AUDIENCE: It allows one person to create so much variety of sound, and the audience was able to here all of the sound at the same time. When you're just playing by yourself, there's only so much you can do.
- **NEIL LEONARD:** I guess, especially if you're playing a wind instrument. I was reading a biography of

this really famous sax player, Stan Getz. And he did a recording in, I'm guessing in the '70s, with like a echo kind of box. Things a tape delay. An analog tape delay. And he talked about-- the first recording he made was published, it sounds wonderful--. Have you ever heard that, Mark?

MARK HARVEY: Who's the Guy?

- **NEIL LEONARD:** Stan Getz. Playing through the echo.
- MARK HARVEY: Yes, I have.
- NEIL LEONARD: It's called "Another World," or something like that.

He plays wonderfully, but he also says that this is a time when, in the jazz world-and I think that in so-called rock music, electronics were embraced, and don't really I don't remember them being challenged. If Pink Floyd, or Jimi Hendrix, or somebody had synthesizers, that just seemed like it was OK.

For jazz musicians, it seemed like it was somehow straying from this tradition that shouldn't be tampered with. And Stan Getz said that it felt natural to him. And it gave him something to do, which you couldn't do with the sax. You play harmony. So if he played a delay, he could play one note, and while that note's ringing, he could play second note, and make chords, basically. Which he'd never been able to do before.

There's also another instance from around that era that caught my attention. There was a flute player named Paul Horn. And he did a recording at the Taj Mahal. And I think it was like this gorilla recording where he walked in and set up his tape deck. Now you probably couldn't take a tape deck into the Taj Mahal. I'm guessing. Or into the Vatican. You'd be screened. But he said he pulled the tape deck out and started to record, and it was the same thing. It is a very, very long reverberation, so you can build harmonic structures for the flute, which you can't do in a room like this without the use of electronics.

And so, I don't see a difference between using the Taj Mahal to do that, versus

using, like, analog tape delay. If you get to play chords, and that's a really fun thing to play with, then I want to experiment playing chords. If I can get the Taj Mahal, I'm happy to get it but, I'm not going to bring the Taj Majal to Killian Hall downstairs. Whatever I bring is probably going to be some kind of computer software. But in principle--

AUDIENCE: I wasn't saying like-- I just feel that usually things don't work as expected. People will bring in things, and mics won't work, or whatever. At the end of the performance, it might have been better if they just played it. But in this case, things worked out the way you wanted them to.

NEIL LEONARD: Not everything worked perfectly. And I was interested in when things didn't work perfectly. It was still a performance, and if something doesn't work, you go ahead. At one point, I put the wrong page of music in the music stand, so when we got to that point, we missed the first Bar. But I figured, just go ahead. Don't worry about. But I also noticed-- and I don't know if anybody else caught this-- but when Robin was doing the first piece, he played one piece of just kind of like delays, and just like a wah wah on trombone.

And then he played a second piece, that was-- he started with a drum pad, and started looping that, and knowing some of those rhythms, I knew that if you don't get the loop right in the drum--. You can record it with a kind of a glitch, which he did. And he didn't remember how to delete the last thing he recorded. So you just see, do I go ahead with this thing, which is not really perfect? And at one point I could just see, like, he's just going to go with it. And put the rest of the stuff in, and start over dubbing the trombone. And start playing on top of it.

So I could look back and think of a handful of things that, if this is a published DVD, or published recording, you would hope you'd be able to fix somehow. Or have another take of, or whatever. But I think the wonderful thing about a live performance is, it's like how do you get out of the situation you're in?

I've seen sax players, and their neck strap breaks during a solo, and they keep playing. Or the snare drum breaks in the middle of a solo, and the drummer keeps

playing. In a recording, you would stop. But in a performance, it sort of like it was like a basketball game, or something. You just can't say, I've gotta go tie my shoe. Everybody wait. You just have to do it, and that's a really fascinating kind of challenge You had a question.

- AUDIENCE: What were you doing in between solos, when you're going up to your computer. Were you changing variables, or just playing new loops?
- **NEIL LEONARD:** Between the pieces?
- AUDIENCE: No.
- **NEIL LEONARD:** In the piece?
- AUDIENCE: Yes.
- **NEIL LEONARD:** I'm trying to remember. In the first piece I played--. Depends on the piece. Sometimes there is a combination of-- I would like to be able to do everything on the fly, and if I had four hands I could do everything on the fly. So I could play the saxophone, and I could be in front of the computer, and make the computer do its thing. So mentally I think I could do that, too. I could set it up so more hands-on involvement with the computer would be possible, but I could still play sax.

But I only have two hands. And the sax is like the banjo. Your hands really have to be there. You can't really get them off, and keep playing. You can't get both of them off and keep playing. So some of the music is created in advance. So the stuff, which I think it played in class last week-- there's a piece I played that was like time stretch voice and bells-- we talked about that. So that is really kind of a module of a piece that's composed.

So a lot of time, it's like working in Photoshop or something. You sit there and you work, and you work, and you work in sounds. And you see if they need any modifications. You see how to combine them. You kind of get a sense of the dramatic flow of the piece. You work it out. And then you bring that file to the concert. And some of that's playback.

So some of it's play back, and some of it's live. Anything that sounded like process saxophone was live. But if it sounds like it was voice, then that was a vocalist who was recorded, and then processed, and then kind of montaged. So sometimes it was like triggering the next samples.

I think in the last piece I played, I made the software for that just that week, if not a couple days before. That one I think I managed to mostly do for the panel. But if it was getting squirrelly, I may have gone to the computer to try to get it to behave better. So anything from just triggering files, to kind of a small adjustments to keep it all reined in.

- AUDIENCE: So when you were playing the pieces, I actually thought that some of the process saxophone was recorded. As I was watching your foot and seen when you pressed the pedal. And it looked like the pedal did lots of-- I initially expected the pedal would be something simple, like the pedal adds the delay. But the pedal caused so many different effects that I assumed some of the saxophone effects has been pre-recorded and the pedal was playing them back. What exactly did you program the pedal to do?
- **NEIL LEONARD:** The pedal just sends a signal to the computer. So it's kind of like a mouse. It, by itself, is really simple. You can read the switches from the computer. But the way the computer is set up to respond, the way I set it up in a concert to respond to the footwork work, was fairly straightforward.

The computer does three things to the sax. It will do different kinds of delays. And the delays will-- maybe when we get through, if you're still interested, I could show how the delay stuff works, but-- the delay business works two ways. One is, it makes an echo. And the second thing it does, if you think about the early tape delays, they have a tape loop, that just rotated. The tape loop was played, and then there were different playback heads, to play it back at different points.

So you have one record head, and then you have multiple playback heads that can be moved. And if you move, they kind of echo. The ricochet kind of effect. The echo effect changes from like [MIMING ECHO EFFECT] You can change those echoes where there on time. If you move the playback head, it's also a changing the speed that its reading the tape. So if you have a note which is [MAKES NOTE SOUND]. And the tape is going like this. And you move the playback head this way, you're going to get glissando [MAKES NOTE SOUND] Because you're increasing the speed at which the tape is passing over the playback head. If you move it the other way, it goes down.

So in the digital world, you can get that, too. So, the delays are kind of modeling a tape delay system. You can speed up, while you're sort of moving the playback heads, you get pitch consequences. Or kind of result in glassindos, or glassindi, as well.

The other, third thing which makes the delay business complicated, is there's a foot pedal which-- not everything's going to delay-- which changes things radically. So if you play a phrase, and at the end of the phrase you feed more of that into the delay, it kind of accentuates that one thing. Sort of like a sustained pedal on a piano. If you put it down for half of the phrase, but not the rest of the phrase, one part of the phrase has this accentuation, or this effect, that the rest of it doesn't have.

And that can be a tremendous, dramatic change. But to keep it short, there's a delay. There is kind of like a pitch bend idea. There is a flute player you guys might have heard, a gun named Robert Dick, who made a glissando head for the flute. And the way it works is, it slides in and out. So you play a note, and there's a thumb thing. And use this thumb thing, lever, whatever it is, to make this head joint slide. So I think that the blow hole's not changing, but I think something on this side of the head joint is changing. So the glissando flute.

AUDIENCE: [INAUDIBLE]

NEIL LEONARD: Is it the mouth piece that slides? I've never actually seen one. OK. So I wanted to do that with the saxophone, but I resorted to doing it electronically. I wanted, like if there was a harmonizer, there are three voices playing in harmony. I wanted those

three pages all to be variable, so they could slide in real time. And I had particular ways in which I like to slide them. But sometimes you heard a harmony, and it sounded like there was a whammy bar, or sort of a glissando. I built like a harmonizer with a glissando mechanism in it. And so, the second one.

And the third one is really simple. I don't use it as much. Actually, there's four things I've been doing. The third one was just a random looping thing. It's like so the random cut and paste. So I'd play something into the computer, and it takes snippets of that, and kind of like feeds them back, or replays them in sort of an arbitrary fashion a real time. So it doesn't sound like a beat-oriented looping effect. It's just sending back fragments of what you played in a kind of unpredictable way.

So you get a kind of a stochastic re-compositon, or re-improvisiation of something you played. That was the third thing.

AUDIENCE: The final one, I just figured out a couple days for the concert, was a kind of freeze effect. It's using anybody's intel, like audio engineering. It's using fast Fourier transforms, which basically take a snapshot of the sound, in terms of the pitches that are in the sound. Remember when we looked at that piece of software last week? We took, I think a trombone sample, I think that's what we had. And then we were stretching , and we were cutting it up, and playing with it.

So for software like that, you can take a so-called frame, we'll say it's a 24th of a second, and do a spectral analysis of that 24th of a second. And then freeze it. Just play those frequencies in the frequency domain, and just hold it. And so I have, I think eight of those going. And every time I hit a peddle, you freeze another instance in time. So the idea was twofold. One was to, again, to build up harmonies. So every time I had a not that I wanted to freeze, I'd hit the peddle, and that gets sustained. But then there was kind of a poetic idea, which is really sort of pun in a way.

But the song I playing was playing is a song called, "Round Midnight." It's very slow, and very kind of somber. And I thought this idea also fit with that song, because it's like stillness. The song is quiet, slow, still, and this would make it extremely still, because it freezes things. So I played around a little bit with that.

So those were the things that you could do with the sax. It's actually quite a bit of stuff. And when you think of it, when you think of what guitarists like Jimi Hendrix used, he didn't have that much stuff. He had like fuzz box, he had wah wah pedal. And maybe like one more thing. I'm not a guitar effects connoisseur. There isn't a lot of stuff, but it changes the guitar completely.

So I'm finding that I, too, don't need lots and lots of stuff. In fact, the fewer things you have to use to process the sax, the easier it is, because there's not that many choices. So you still think you're playing the sax, with a few, fairly straight forward things you can vary.

So that's sort of, I think for Robin and myself, soft of the inspiration. We found guitar players modifying the guitar, we think, well, why can't we do that, as well? So, we can. We can do it without an extensive background. Robin does not have an extensive music technology background-- or with a different, more evolved background in music technology, which I have. And both of them will work. In the case of Robin, he's such a good trombonist, and improviser, that you give me a couple things, and he does great stuff with it.

Those were some of the things I was playing around with, or using the computer to do, to extend the performance.

MARK HARVEY: Let me shift so we can get our projects in, and if people have questions at the end, we will hopefully have time for that.

So we have our teams again. And so, what I think we should do is, Neil will help with logistics, if you want to set up a computer, or whatever you have. So we should just go. And the team should just say a little bit about what it is your idea is, and then enact it. So who would like to go first?

AUDIENCE: So me and Brian, we both recorded sounds separately. I recorded sounds in my kitchen, and made it sort of like a sound stage thing. And then, Brian recorded some guitar sounds, and other sounds he found [? at the bakery ?], and he put on them

on this little mini board, which you can play different sounds and stuff. So I'm using Ableton Live [INAUDIBLE]

- **MARK HARVEY:** Did you come up with a design, or a framework, or is it just going to be sort of spontaneous?
- AUDIENCE: The framework is the kitchen sounds kind of form a beat, and we're going to be going around that. [MUSIC SOUNDS] I recorded most of the sounds here. We'll just go into some of the sounds. One was my lamp switching on and off. Another is my guitar feeding back. Another is an effects pedal that I have that does some really wacky pitch shifts and dive bombs, essentially. And mine, I was banging on random things. And then I used a harpoon growler as a jug. And some other things. I forgot everything. Bottle caps.

[MUSIC PLAYING]

[MUSIC PLAYING]

[APPLAUSE]

- **NEIL LEONARD:** That was cool. It sounded like a voice, that last thing.
- **AUDIENCE:** Yes, that actually was my voice.
- **NEIL LEONARD:** You've got new careers. Very coo.
- AUDIENCE: So we recorded sounds just on an iPad. And then, put them on there. And we're just playing everything. About eight different tracks, [INAUDIBLE], no data tape. And we're just going to be looping those all the time, on different tracks, on and off. And then, I'm going to briefly play the piano, at the start. And then just come and control this.
- MARK HARVEY: What are the sounds?
- AUDIENCE: Right. It's sort of more ambiance, rather than snippets of sound bites. It's sorta like longer recordings. It's like a shower.

MARK HARVEY: OK. Shower type of--

AUDIENCE: Yeah. You can figure out what sort of--

MARK HARVEY: So it's a challenge. We've got to figure out what the sounds are.

[MUSIC PLAYING]

[APPLAUSE]

Did you have that ending worked out?

- AUDIENCE: Yes. That was actually a recording of a door creaking, that had some pitch to it. So we decided to use that. [INAUDIBLE]
- MARK HARVEY: Very interesting. Very interesting. Let's give a round of applause, first of all.
- AUDIENCE: I think a lot of the other groups had some mixed background noise that they recorded, and then improvised with their instruments on top of that. And I was feeling a little sick, and didn't want to play my trumpet, so I took sort of complimentary approach. The sounds I recorded will be the improvisation. So I went around my dorm and recorded 15 different sounds. And then wrote a Python script that sort of generates a random way to play these sounds.

So at different sections of the song, like at the beginning, it only picks from a certain number of these sounds, all of which sound like fans. At the beginning, it's like a fan and AC, a few other things like that. And then as it progresses, it adds on more of these sounds. I have a little solo section in the middle. We'll even hear a couple of appliances, and noises. Big solos, and then it goes out to some ending. So the direction of the piece is planned, but exactly what sound is played, and when, and for how long, all that is randomly generated each time we play it.

[MUSIC PLAYING]

[APPLAUSE]

MARK HARVEY: So it's your program that's doing the improvising?

AUDIENCE: Yes.

MARK HARVEY: Very interesting.

AUDIENCE: So to answer the other question, what it will do is, it will play a sound, play random sounds, wait for a random amount of time, and then play another sound. Sometimes it waits until the sound is finished, sometimes it doesn't. So that it can be positive, that can be restive, and there can also be two or three sounds playing at the same time. The only thing, I put the solos so there was never two solos playing at the same time. And I made sure that each solo was played once. But otherwise, all the other sounds, you have multiple [INAUDIBLE].

Yes I had the dishwasher sounds not play until the very end. And I closed the dishwasher a few times until I got a nice satisfying crash and recorded that.

- **MARK HARVEY:** Did you break anything? OK next contestants.
- AUDIENCE: We recorded five sounds. A door closing, someone typing on the keyboard, a pencil scratching, a zipper, and a microwave turning on. I assigned them to different keys on the keyboard, here. So I'm going to make a beat with these noises, with these sounds, while they improvise.
- MARK HARVEY: Did you say a beat?
- AUDIENCE: Yeah. So I'm using them mostly as percussion. So the sounds were things that I [INAUDIBLE] homework, so I guess that is our theme.
- MARK HARVEY: Homework?
- AUDIENCE: Like you got the drone or a beat or just melody or some [INAUDIBLE] Whatever you want to do.

[MUSIC PLAYING

[APPLAUSE]

- **MARK HARVEY:** So given that's a sort of existential homework moment, what time of the day or night would you project that to be happening?
- AUDIENCE: After I just ate.
- **MARK HARVEY:** After you just ate. Very cool. Very cool. OK. Another group.
- AUDIENCE: Each of us had a different idea that was discussed in class last time. I think we tried all the ideas, and none of them really worked, because we didn't have good enough recording equipment, and we weren't good enough at using that recording equipment to effectively do anything. So we decided on a-- [INAUDIBLE] So you might recognize some of these Sounds. We found a sound board on the internet. Unfortunately it's mono-phonic, so the amount of stuff we could do is a little bit limited. We were planning on using this sound [PING] as a sort of reset button for between the sections.

[MUSIC PLAYING]

[MUSIC PLAYING]

[APPLAUSE]

- MARK HARVEY: Good. Good. That the idea.
- AUDIENCE: I don't feel so guilty saying that at times I was trying to make you guys feel uncomfortable.

[MUSIC PLAYING]

[APPLAUSE]

- **MARK HARVEY:** Thanks for the extra effort. That was actually fascinating to watch you do all that stuff. Neil, do you want to just make a few comments, or whatever you want to do.
- **NEIL LEONARD:** How many people have done something like this before? Anybody? And suddenly you've done Ableton Live. And how many people have done Ableton Live? One, two. So, what have you done with Ableton Live before?

- AUDIENCE: [INAUDIBLE] Just learning how to use it. I really haven't been that into it, because I feel very limited, because I haven't actually bought the full version.
- **NEIL LEONARD:** So you're starting to use it now?
- AUDIENCE: Yeah.
- **NEIL LEONARD:** OK. Just curious.
- AUDIENCE: In the past, though, I worked with Serato Scratch Live, though. Actually, I use that for DJ'ing.
- **NEIL LEONARD:** OK. Yes, but in terms of-- when I asked the question of how many of you have done something like this live, what I'm wondering about is how many people have recorded sounds on their own, and used them in a musical performance? You have? For composition. OK. And performance is a little bit different, but it's a little bit the same, as well.

It is really interesting to hear what you guys came up with, not knowing you very well. With my Berkeley students, I always feel like, when they bring in their assignments, it sounds so much like them. But I have a longer time to work with them. So I can make some more connections.

One of the things that came up in watching you perform, is where is the value in doing something you haven't done before, or something that you may not be comfortable with? As a sort of experimental adventure.

And when I listen to Sarah, and Ben's and James's piece, one of the things which seems to be interesting, is that you guys didn't really know where it was going to go. You didn't know where it was going to end. You said, that's not quite what we rehearsed. And that can be a really wonderful thing. Because the opposite is-- when I played the concert that you saw, if it happened exactly the way it happened a time before, or happened every time, you run the risk of the spark dying.

So the excitement of the performance -- kind of like rigor mortis sets in. The

13

spontaneity goes away, and the spark. The excitement for the performer can be linked to the spontaneity. And you lose the excitement for the performer, and the spontaneity. So when you guys were playing didn't know where it was going to go, I thought, well, that's actually a good thing to just bring up. Because that's the desired effect. And it's a struggle for the improviser, who plays for decades, to keep the thing feeling fresh.

I know for me, there are things you can do. I guess it's like when you're performing, and you're distracted, or you're just not really--. What I'm getting at is, for me the performances are the least satisfying when one of two thing happens. Either I can't relax, and get in the play. So if it's a concert, like with Robin, for example, if I feel for any reason uncomfortable, if the challenge of it kinda psych's me out, or I don't think I know the music well enough, and I start to play, and all of a sudden you feel that tension, that anxiety of trying to get to the music. It's not like a stage fright, it's not like a performance anxiety, but you feel like you're forcing it. And once you feel like you're forcing it, in a performance of improvised music, you begin to lose a little bit of control.

And then the other thing is if I feel like, oh I just played what I played yesterday. I did what I knew I could do easily. Then you don't discover anything new. And I think that what's kind of fundamental in improvisation is this feeling that you're discovering something new. Even if small things are new, but you keeping that little bit of the activity alive. Doing something which is not necessarily comfortable or not something you've done before can sometimes turn into a big gain.

The other things I was thinking about with that piece are-- At first I was thinking I wanted everybody to record yourself. And then you guys, Sarah, James, and Ben, at first I was a little bit concerned, because you just grabbed some sounds from the computer, which I told you not to do.

But the thing which I thought worked really well is, we have such a visceral connection to those sounds. They have a tremendous meaning for us. They give us knee jerk responses, Like if my cell phone is in inadvertently right now. And I hear a

text message sound, all of a sudden I kind of jump. My body reacts like I have to do something. So those sounds have a tremendous kind of power. And we have very important associations, strong associations, with those sounds. So they're totally loaded, and the way you played with them, I thought was really, really fun. I think that the Windows operating system is more musical than the Mac. Side note.

I'm just putting out some ideas that I was thinking about listening to everybody play. The other thing I was thinking of is-- and this is also very true in Austin's piece-- is that working with computers. Computers are not nearly as responsive as a flute, a violin, as a trumpet. You're making music with your index finger. You're not using your whole arm. You're not using your mouth. You're not using your breathing. You're not even using your hands. Are using your index finger. You're moving and clicking.

But I'm also in my own work, interested in the resistance of the materials. So, the computer is totally limited. Or this assignment I gave you. Make a performance, it's going to be three minutes long. You only have a week to make it. You're going to record sounds in your own. Right there it limits what you can do quite a bit. But when an artist is presented with limitations, it's amazing to see what artists come up with.

So the resistance of the materials takes you someplace new. So for example, I'm reviewing a piece of music which is very difficult to improvise on. A very complicated set of chord changes. I tried the other day. I'm just going to play with my left hand. The metronome was fast, the harmonic progressions really hard. I'm playing the same thing over and over again. I'm finding my rut. So what if I just play with my left hand? And I tried that for while. And all of a sudden, I felt like I'm getting out of my rut, because I had to think about it differently. I had to find new things that I could do this hand. Put them both back into play again, and it feels like it's fresh.

So the idea of doing this very short exercise that uses this kind of rigid, somewhat unresponsive tool, to make music, has historically produced some really interesting things that we haven't got out of the previous concert music practice. So those are just some of things I was thinking about. I think if we were to do this again-- if this was a four unit class, of if this was Berkeley and you were doing this as your thesis project-- I think the kind of challenges I found in the last two pieces would be very interesting to continue to explore.

So what about when you've overextended yourself. And you're playing some piano, and some violin, and some computer. Or in my case-- you heard me in Killian hall--I'm doing delay effects, and I'm playing back samples, and I'm playing saxophone. And I'm beginning to overextend myself. It's an interesting problem, and the solutions you found-- it was wonderful to watch you trying to grapple with that problem, and come up with some very interesting solutions.

And I am also very keen on this idea of, is there a set of sounds that you can find that have a really special quality? When you hear Glenn Gould play the Goldberg variations on piano-- and the aria of the Goldberg variations is a very, very simple piece-- and he just sounds phenomenal. He's playing quarter notes. It's just mind boggling good, and he has barely even started the piece. This is amazing. It's the way he plays.

But I guess that's the next question I have for you guys. Are there particular sounds that you hear that would be a good start to a piece? That just have that kind of mesmerizing effect. And they're not necessarily music. I think with the Windows operating system piece, you also had the advantage of some of those micro compositions. Like [MAKES NOTE SOUNDS]. Whatever that is. That's like the shut down sound, or the boot up sound, or something. Like there are already kind of audio jingles, which have been very, very carefully created. And we've heard them many times. They have tremendous meaning for us.

But are there sounds that you hear in the world around you, that would make a really good beginning of a piece. Let's just forget the whole piece for now. Let's just say the beginning of the piece. Something that would be fantastic to hear at the beginning. That would be an interesting thing to pursue.

I'm trying to remember the other solo artist in this group. Jacob, right? Jacob, where

I would like to see that work go is, is there a way that you can share the improvisation with the computer? So you created a piece of software that basically automates an idea about improvisation. You have an idea of how the sounds could play. Sometimes they play together, Sometimes there's silence between them. Sometimes there's 3 over 1. Sometimes they're dove tailing were overlapping. Sometimes they're not.

Is there a way to extend that so you are a physical participant in the improvisation, and the computer is playing a disembodied you. Because basically what it's doing now is like a disembodied you. It's your idea implemented as a program that will execute your idea. Is there a way to have two of you? The virtual you, which is what we heard, and the you present. So, I'm a teacher, so I'm always thinking for my own students, what do I do to get everybody to the next step? Because we're never done. I study all the time. I try to learn new stuff. I could tell you all about that. We don't have the time. But I'm always thinking for you guys, what's the next step? And I think that for Jacob's work, that would be a next step.

I'll just try to touch on one more. Alex, Chelsea, and Chris's, the homework theme. I guess, if you hadn't told me it was homework. I might have been able to distinguish it from the others. But I love the idea of homework. And what moment of homework would be really great to zero in on. It's so rich. Is it like procrastination? The feeling that you learned something new? The anxiety of, oh, no I've got Neil's assignment, it's due in and hour and I haven't started. There's all kinds of ways to think about homework. And it's such a central part of your lives. What could you do to take that another step? I think it's a great theme. And what could you do to distinguish it from all the other works we heard?

So I think that, in short, all these pieces are really wonderful beginnings. And I don't think any of these beginnings is more or less valuable than any other. But I guess my bias is thinking, if we were to continue this, what would be a next step to engage in. To take the same ideas and develop them a little bit more?

MARK HARVEY: Great thank you so much.

[APPLAUSE]

NEIL LEONARD: Thank you. It was great to hear your work, and good to talk to you guys about it.

- MARK HARVEY: Great job everybody. Very interesting The only things I would add is that I was interested how much the percussive element came out in a lot of people's pieces. Percussive sounds, the way you've arranged them, and also how the live instrumentals played with that. And actually, very little silence. There were a couple pieces that had more silence than others, but interesting to think about that. So again, more things to keep in mind.
- **NEIL LEONARD:** The Windows piece had great silence.
- MARK HARVEY: Yeah
- **NEIL LEONARD:** And I think the performers are kept on edge with that.
- MARK HARVEY: It kept the audience on. I didn't know what was going on. OK, so please send in just a little statement about what this was, this project today. And your concert reflection on Neil's concert. And we'll see you Wednesday for something completely different. Thank you, thank you.