An Interview with

CHARLES A. CSURI

OH 180

Conducted by Kerry J. Freedman

on

23 October 1989

Columbus, OH

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Abstract

Csuri recounts his art education and explains his transition to computer graphics in the mid 1960s. He recalls receiving a National Science Foundation grant for research in graphics. Csuri discusses the use of the computer as part of the creative process of artistic expression and the aesthetic issues surrounding computer use in art. He describes the politics of grant funding in general. Csuri recalls the development of the Advanced Center for Computing-Art and Design. Csuri also discusses new directions in graphics graduate education and outlines important work in graphics development.

CHARLES A. CSURI INTERVIEW

DATE: 23 October 1989 INTERVIEWER: Kerry J. Freedman

LOCATION: Columbus, OH

CSURI: My history as an artist and computer graphics researcher may help to explain my point of view about my art work since I was there at the beginning of computer applications to the fine arts and especially computer animation. I studied art in the 1940s. My first teacher was Professor James Hopkins who emphasized realistic portrait painting in a neo-impressionistic style. I was taught anatomy, academic perspective, and how to make the flesh tones of the model using the colors alizarin crimson, meridian green and titanium white. There was absolute silence in the classroom and you had to keep your palate and brushes neat and tidy. Professor Hopkins told us stories about his life as a young artist in Paris where he met Degas and Renoir and his experiences offered to us a very romantic view of the artist. Just imagine, my teacher actually talked to Degas. An important teacher in my development was Professor Hoyt Sherman, who had radical ideas, at least in the context of academia, about visual organization in art based upon visual perception and gestalt psychology. We were introduced to modern art through the paintings of Paul Cezanne, which then led us to Cubism and the modern art era. As part of his approach to drawing, for example, we were taught about kinesthetic visual form in the context of drawing in total darkness on large sheets of newsprint paper using heavy stick charcoal and responding to slides projected at 1/10 of a second. It was called the "Flash Drawing Technique." The slides were of abstract shapes in a variety of combinations representing formal concepts of visual structure. Roy Lichtenstein, the famous pop artist, and I were friends and colleagues who had a dialogue of about 15 years on Sherman's principles of visual structure. We really struggled to understand the meaning of structured color in modern painting. We took delight in using what sounded like scientific ideas from gestalt psychology, such as figure and ground relationships, coincidence of edge devices, the picture plane for structured color with overall tonality based upon hue rather than the same tone for each color, localities of dark and light in the visual field, the importance of a kinesthetic approach and tactile sensory relationships to the position of color shapes on a two-dimensional surface. Three dimensional space, perspective and chiaroscuro did not exist for us. Everyone who did not agree with us, of course, were simply romantics and fools. Between 1955 and 1965, I exhibited my paintings in New York city. I had two one-man shows and my work was included in numerous group shows involving several galleries. I went

through a range of styles, techniques and philosophies in my work. I poured paint out of a tin can, worked with bizarre combinations of plastics and paints, I worked with opaque projectors, and years later, I learned that some of my work was Conceptual Art. I did not know that it might have been important work and simply moved on to other things that were of greater interest to me. During this period I met abstract expressionist Jackson Pollack, Franz Klein, Clifford Still, and many other artists in the New York scene at the old Cedar Bar hangout. I also became friends with sculptor George Segal, and Alan Kaprow of 'the happenings' movement. I had the pleasure of being the model for Segal's famous "Diner" sculpture. Talking to Alan Kaprow was an interesting experience, and his projects were indeed challenging and provocative. For instance, when he filled a New York gallery full of used automobile rubber tires, or when he had a 'happening' involving several dozen people and a Volkswagen covered with jelly. The participants licked the vehicle and the process was recorded onto film, and indeed it was a happening. I was a part of a circle of people who knew the Pop Art group before their work had the name of Pop Art. Because of these artists, I had some vicarious pleasure with being associated with the anti-art attitudes that led to Pop Art. It was during this stage of my career, 1965, that I discovered a computer graphics output device. Before I continue with comments about computers and art, and my recent art work, I need to return briefly to 1955, because that is when I was introduced to the computer. That's 34 years ago. At the University, a personal friend, Jack Mitten, who was a professor of engineering, began explaining to me computers and their applications for science and engineering. I asked all of those initial questions, like, 'What is a computer?' and 'How does it work?'. He patiently explained to me basic ideas and we began a dialogue about computers and art which continued over a period of eight years. At first he would describe the problems of converting by computer programming the Russian language into the English language, and that was a radical idea in 1955 - it may still be a radical idea. Please keep in mind that in 1955 there were no plotters or graphics output devices, but I was able to speculate about computerized theories of art and notions about artificial intelligence. The ideas were interesting, but the practical reality of programming prevented me from taking any serious action. We were close personal and social friends and our families frequently ate dinner together. During the cocktail hour, we would talk about computers, and as the martinis began to flow more freely, so did our ideas about computers and art. Then in 1965, I discovered in the university some research where several engineers produced a computer picture of a young woman's face with a special typewriter which could strike paper using ten levels of grey. Once I saw the picture and understood how it was produced by the computer, I instantly understood

the implications for art. But remember, I had an eight-year dialogue with my engineering friend about computers and after drinking gallons of martinis over eight years, I knew the path I had to take with my art work. For three years, from 1965 to 1968, I used computer graphics as an artistic medium which led to my involvement with the now historic exhibition entitled "Cybernetic Serendipity", held in London, England 1968. I also quickly learned that computer technology is very expensive, and if I wanted special artistic tools, I had to find a way to raise money in order to hire programmers and buy equipment. Through the encouragement of my scientific friends who were intrigued by my vision, I wrote a research proposal and submitted it to our National Science Foundation. I had no formal credentials in science, although in my education I had demonstrated an aptitude for mathematics and science in general. After many months of debate, the National Science Foundation miraculously awarded me a major research grant. Fortunately, they had a missionary view about the impact of computers upon society, and felt they had a responsibility to demonstrate the potential for the fine arts. As I understood the broader implications of computer graphics, I became very involved in basic research and set aside my attempt to produce art. I shifted my emphasis because it was the only way I could acquire the necessary resources to develop some of my ideas. It was also very clear that this agency could not justify continued support for the fine arts. The National Science Foundation and other federal and state agencies supported my basic research activity for over 20 years - approximately 6 million dollars. These resources afforded me the opportunity to build a laboratory which today has over 20 full-time professional staff committed to advancing the state of the art in computer graphics. The funding for the laboratory no longer depends on external grants, but is supported by the Ohio State University. This has enabled me to build an academic program for computer graphics research and the fine arts. My colleagues and the students in my laboratory have advanced the art of computer animation in particular, both technically and artistically. I am very proud of what they have accomplished as evidence by two major prize winners in computer animation at Arts Electronica, the work of Joan Stately, Michael Girard, and Susan Anfrom(?). Other former students and staff who once worked for my computer animation company, Cranston/Csuri Productions, have set a high standard for commercial animation. Then, about 14 months ago at the urging of my wife Leigh who is a major artistic talent as a sculptor, I decided to make art. Once again. She probably got tired of hearing me complain about bad computer art. This was a very difficult decision, because I had thought I had buried my role as an artist, and to revive those feelings was somewhat terrifying. "My God, now I have to make art." At the same time, I was very curious about

what I could do with the technology given my artistic background and my research experience in developing the field of computer graphics. The transition back to a role as an artist from that of a researcher was very difficult psychologically. My students have done so well, and I was placing myself in an awkward position because "it's much easier," as the expression goes, "to talk a good game," but instead to produce your own art work is far more difficult. It is important to me that you understand the road I have travelled as an artist because my background and experience influences the way I look at computer graphics and art. In many respects, I feel as though I have spanned the entire 20th century. But in some fundamental sense the problems of personal identity as an artist are still the same. I feel like an old-fashioned expressionist painter who got caught in some kind of time warp that included the computer. My spirit and temperament is that of a romantic who is involved in symbols and icons representing humanistic values which may belong in another era.

FREEDMAN: That's really good; rich for all sorts of different things that I'd like to talk about. Let me go back in time a bit. There are a couple of questions I want to ask you about when you first started working with computer graphics. I wanted to ask you about 'Sine Curve Man,' for example, that particular piece. I know that won an award in the computers and automation show, and that piece has always been interesting to me because that was the first computer graphic piece that I saw when I first started taking courses in it. It was also the piece that generated my first piece in computer graphics, so I've always wanted to ask you about that particular one. How did you get the idea for that, and what stimulated you?

CSURI: Well, I think at that time I was interacting with a friend of mine, a professor of mathematics, Leslie Miller. He was, I recall, very involved in different projective transformations in mathematics. His area was something called conformal mapping. How you could take something that's in one coordinate system and then map it into another coordinate system. Then the consequence, of course, if you're talking about lines or segments of lines, it alters the way it appears. And he helped me develop a program that dealt with sine waves. I discovered that by playing with various parameters, I could take a drawing and change its shape. But I can't really tell you why I decided to do 20 variations, or 10, I've forgotten how many. I think it was somehow connected to maybe the way I looked at shape and color based upon my tradition training that a single line drawing using a sign curve just simply wasn't interesting

enough, and I felt that by experimenting - and indeed that's what I did - I would get these transformations. I have some now, today, that I'm experimenting with that I really don't know what they're going to do, but then it sort of looks kind of interesting. It looks different in some way, or it somehow adds up to some kind of expressive quality. I don't think I can go beyond that in terms of giving you an explanation.

FREEDMAN: It sounds, from what you were saying, that you've always been interested in figure, though. Is that right?

CSURI: Yes. I think principally interested in the figure. I've always been fascinated by the great artists like Rembrandt or Hals, and portraiture, and really trying to look at humanistic qualities through the figure. Although I've done abstract painting, it was, even in that case, it would be based on some human figure. While I think I know a fair amount about visual organization and abstraction, that as an end is not very interesting to me. I just find it kind of boring.

FREEDMAN: Are there other themes that run throughout your work that maybe tie your painting to your computer graphic work besides the figure would you say?

CSURI: I think in my painting, even when I was very young, I was very interested in making pictures of old people, of age; in a sense, talking about the human condition. Also interested in things that are more poetic: children, birds, flowers, mother and child theme - classical themes. In fact, one of the things I struggle with most today is really trying to understand my own iconography, trying to understand what symbols do I want to work with? What do they mean? And, will anybody understand what I'm trying to say? This is a particularly difficult problem in contemporary art, because everything's been done, and it's very hard to present things in a unique way. But I'm somewhat hopeful that because of computer graphics and the capabilities I have with manipulating visual information, I might be able to present relationships that would be difficult to do by conventional methods, or perhaps because of the nature of computer technology, you wouldn't even think of it in a conventional idiom.

FREEDMAN: I remember the other day when we spoke for a few minutes, you said something that really interested me that I've been really curious about. Tell me if this is a wrong interpretation, I can't quote it I'm afraid. It was something like, 'The computer really can provide visual possibilities that we can't imagine yet.' How do you see that affecting your work, and art in general?

CSURI: It's interesting... When you look at what artists have done in the past, and even photographers, we are obviously very bounded by the way we live in the world. The physics of the world influences us. The kind of perspectives, the view points that we take of an object and the way we look at it is, again, affected by the physics of how we see everything. The artists imagination, of course, can alter that. You see in Surrealism a lot of interesting things, or even in Renaissance painting, the idea of angels in the clouds. That's not real either. I've been looking at photography a great deal in the last several months. Not that I want to be a photographer, but I'm looking at old photography magazines and just trying to get an idea of what do people look at? Photographers, clearly, are bounded by the physics of everything. I mean, they do all sorts of crazy camera angles to get at different special effects, or they will do something in the dark room with the chemistry, in the way that they alter the image and so on. Well, I think with computer graphics you can do those sorts of things, but I feel that as you experiment and play with the way you build objects and the way you can play with relationships, that you at least have the option of combining things in ways that you ordinarily would not think of if you're working in a more traditional medium, or if you're a photographer. Now, I think you have to be open to that kind of thing. You have to be searching for combinations of the way you position things in space, the way that you combine objects. I mean with computer graphics you can end up doing what every traditional painter has ever done, or what photographers do. But I think the more interesting challenge is really to do things that one would not ordinarily think of. I think from my point of view, I sort of have a rule. I ask myself a question: "Can I do this by conventional means?", then I'm on the wrong track. It's sort of a simple statement that I make to myself that I've got to... Maybe once a painter sees that they can go ahead and imitate that, but I am trying very hard to push my ideas about space, color, and imagery and the way I juxtapose things, and I try to avoid doing it in a conventional way. It may well have conventional elements in it, but there has to be some one thing that's a little different. Otherwise, I don't think it's very interesting. I don't think that in itself gives it aesthetic value. I think what I'm really talking about is an attitude about how I approach the creative

process.

FREEDMAN: It sounds like history, the history of art is very important in your work.

CSURI: Oh, absolutely. I'm probably very typical of somebody in my generation, post World War II, with real shock waves in terms of how the art scene has changed. Once you have been exposed to modern art - I mean, the Armory show was, I think, such a critical thing - you start thinking about a concept of progress, wondering if (?) that's true, but it's a kind of anti-art attitude, meaning that you try to fight against what is accepted. You're trying to move into new territory. I've asked myself so many times, 'well, has this been done before?', 'is this interesting?', 'why are you doing it?'. It grows out of an attitude about an anti-art statement, and I think that in order to do that in a way that might be meaningful and interesting, you've got to have an understanding of what has transpired. You've got to know the motivation in back of the art work, and then ask yourself a lot of questions. I don't think that, again, by itself answers the question of the artist. You have to ask other questions that are much harder as to try to understand who you are as a person, and what is natural for you. How do we know whether we're being honest with ourselves? There has to be a kind of personal integrity where this is what you are and this is what you do, and I don't know how one discovers that, because there can be so much deception. It a curious game that one plays with oneself psychologically.

FREEDMAN: I have a feeling a lot of people who make art have that concern. Think about those things, worry about those things.

CSURI: They do or do not?

FREEDMAN: I think they do.

CSURI: Yes.

FREEDMAN: So, how do you feel the computer fits into that? For example, do you miss tactile sensation of painting in this creative process?

CSURI: Not at all. I don't at all. Wait a minute, one disclaimer here. Remember, in what I'm doing, I'm still involved in traditional media. You see, I still draw and paint, and this is somewhat different from what most people are doing with the computer. I think that my drawing and painting is very critical to what I do because... I have a certain ability to draw and paint, and I can through traditional media create icons and symbols that are exceedingly difficult to create in the computer. Maybe I do need some element of a tactile. I don't know, I haven't thought about it. I find it very hard to draw on computers, extremely difficult. I'm finding that psychologically it's very hard for me to develop a kind of, what I would call, a tempo and a momentum, a patience. Because with the computer it's so easy to do all sort of transformations almost instantaneously. You can get with image processing in particular an overall effect in a matter of seconds. Well, just physically to apply paint or pastel to a piece of paper will take you a minute or two, you know? And assuming you know what you're doing. So, I think shifting back and forth I find very difficult, but I'm learning. I think I can make the adjustment. But I absolutely enjoy, once I get my drawing into the computer, the ability I have to play with space and objects combining my drawings. I can do things and test things I could never do with conventional means. It would take too long and I wouldn't bother. But I think at the top level I'm still thinking about, 'well, is this interesting?', 'is this a good shape?', 'what are you trying to do with this thing?', 'what are you trying to say?'. I mean those questions are there. It doesn't matter whether it's a keyboard or a brush, it's all the same.

FREEDMAN: Those are aesthetic issues.

CSURI: Yes. Those are the same. For me.

FREEDMAN: Let me ask about another specific piece. "Hummingbird." I know that was another award winner a number of years ago. And there were a number of pieces that I recall that had to do with that type of transformation - sort of metamorphosis kinds of things. How did you get into that issue, call it metamorphosis or whatever?

CSURI: I'm not sure I know how to answer that right at the moment. I think that something like that falls out rather naturally for me in the context of computers because when you become interested in transformations and you see the infinite possibilities, at least for me it was very easy to make that connection.

FREEDMAN: I think you really, from my study, one of the first ones who really pushed that idea, worked it out thoroughly, and continued it as, maybe not a theme in the sense that we were talking about themes before, but as an issue in computer graphics. So anything you could say...

CSURI: Yes. But the other image that I happen to like - it's in my office - is "The Aging Process."

FREEDMAN: Oh. Okay. Good connection.

CSURI: The young girl to the old woman, you see? So you get a kind of transformation - I don't if you want to call it a metamorphosis, but there is this idea of change, and the idea of time, and things are not what they appear to be. Things change. I'm still very interested in that idea. I don't whether to try to talk _____ concepts about time and reality. I suppose I could. But it's all connected to that, of course.

FREEDMAN: So you would say, maybe, time is something you're interested in both in static images that represent metamorphosis and also maybe in time and animation.

CSURI: Well, yes. I'm interested in paradoxes. In ambiguity, you see. I think those sorts of things are more complex. On one level you see it as one kind of an object and then you see, well, it could mean other things. I think that in many works of art that's part of its' appeal and there are levels of meaning that could be involved. You can look at a picture of a person, let's say a young person, but the treatment could be done in such a way that it also reminds you of death as well as life. Those kinds of issues.

FREEDMAN: I bet you're interested in Gestalt psychology then.

CSURI: Yes, but I don't profess to be a student of Gestalt psychology. I think that it's just the nature... Things are never really quite simple. When we are very young, we'd like to have clear definitions and clear meanings, just like people. You'd say, well there are the good people and the bad people. And you find, yeah, there are some people that are basically rotten, and some that are basically good, but even in both cases there are other dimensions, contradictions. Inevitably you have to develop a kind of flexibility in the way that you deal with those things. Otherwise you can't survive psychologically.

FREEDMAN: So, would it be correct in saying that those types of issues that you were just talking about, time, change, ambiguity, those are things that maybe can even be looked at through the computer better than through traditional media?

CSURI: Well, I don't know. Maybe. Perhaps because you can do transformations more rapidly you can, in many ways, experiment in ways that are quite difficult by traditional media. I mean, I find it's amazing the number of combinations that I can come up with in an hour especially as I involve image processing techniques, and the way I can alter color, and the shape that affects the psychology or the meaning of the image. I think that's true. I feel that's part of the excitement, that you have a bigger playground, and I can, I think, truly experiment in ways that I could not experiment, not as easily, in traditional media. That's part of the real excitement is the fact that it has all those options and it can. A lot depending on your training and your software and your attitude about the creative process. Right now, I'm just having the time of my life in working with it, because I can do things that are outrageous and in an afternoon I can come up with four or five distinctly different variations on a theme. I can show you examples of that. I get a printout, an inkjet printout. It doesn't look exactly like a photograph, but it's close to a photograph. I'll put four or five variations and I'll have to decide which one's the better one. And I could never do that traditionally - much harder. I can show them to my wife and say, "Well, which one do you like?" I show them to my daughter, and I get feedback and it helps me to decide whether I'm on the right track of things.

FREEDMAN: So that can be a new aesthetic issue that computers have made possible, would you say? This kind of

interactive aesthetic decision making? I don't know what to call it.

CSURI: Yes, I think that you could think of it that way. It certainly can alter the decision making process. I mean, there are times when I can decide, "Yeah. This is right on the money. I know this is right." But then most of the time I'm not so sure.

FREEDMAN: Or even to have the choice is different.

CSURI: And what's interesting is that I can, and I hadn't thought of it until you just mentioned it, I have all the programs that create my pictures. I have all the data, okay? This is the nature of computer activity. And somebody might criticize, and it might be a legitimately good criticism. I can go back to my program and alter it, and make the image much better. I could never do that in traditional media. That possibility is there because of the software and the database. Or based upon the feedback I get from an image, I might decide, 'Well, I kind of like those two things, but maybe I'll put something else in there instead of what I had. A third object' or something like that. It conveys a much better idea, and it's so easy to change the background color, it's no big deal, its a parameter, you know? The thing that I can do is, I have many false starts, if you want to call them that, where I have basically some objects set up and the script is there, it doesn't quite work, and I'll set it aside, it's in the directory. Later on, I'll think about, well, it was sort of in the right direction, but I really should've added a couple... I can go back to that. I can alter it. I could never do that. You just don't go back to a painting. You don't go back to a drawing, you see. Here you have a lot more flexibility.

FREEDMAN: Working things out in series is really the only way painters have been able to do that. And I've always thought that this is a great advantage of the computer. It really enlarges that notion of working on a series. Can I go back in time a little bit here? I just have a couple of things that your statement brought out. Did you mention what schools you went to?

CSURI: No. I went to Ohio State University.

FREEDMAN: Someone mentioned that to me and that's why I wanted to ask you about it. How was it being a student here and then coming back?

CSURI: Well, I don't know. I attended Ohio State University at a time where I felt that the art program, as I look at it historically it was pretty dynamic, and Hoyt Sherman was a key person in that. He had a very profound influence on Roy Lichtenstein. And he had a lot of influence on me, too. Although I fought with him much more than Roy did. I should have listened more, maybe, I don't know. Anyway, it was an environment where there was much conflict, but there were a lot of ideas being kicked around. And there was a real conflict between Erwin Fry, who was a sculpture professor and very much part of the humanistic tradition, and Hoyt Sherman, who represented a kind of progressive approach to art making. The arguments would get very violent and, while it was uncomfortable, in hindsight I learned a lot from that conflict. I don't know, it's just one of those things... I was a student for... I was about a quarter shy of graduation, then I went into World War II. I was gone for three years, maybe three and a half, I've forgotten now, and I returned and got my degree, undergraduate degree, and then a Masters Degree. I hadn't really thought about it, but I was asked if I wanted to teach. I said sure, I didn't know what else to do. I mean what do you do with a Masters Degree in Art? So, I began teaching and what was one year turned out to be 42. It was not planned, it's just one of those things. I was very fortunate and I became a full professor before I was 40. I went through the system very quickly. This is an important thing to remember: I was a full professor when I got involved in computer graphics. Okay? So, I didn't have the nonsense of trying to prove to my peer group that I was doing something that was valid. Being a full professor gave me the luxury of ignoring a lot of criticism. Now that's much harder for a young person even today, in departments where there's not very much sympathy for the computer, where the faculty is very threatened by it. So, I didn't have those problems to deal with, so that... I had tenure, you know, it was no big deal. That made a difference.

FREEDMAN: You said you began doing computer graphics in 1965?

CSURI: Right. But I knew about computers for 10 years before that. I think it's important that one realizes that I

really went through a lot of thinking about computers before I actually got involved, so there's a kind of background in history. At least at a conceptual level, I had a pretty good idea of what I was getting into. All it took for me was to see that one picture produced by computer and everything just simply came together for me. And I knew instantly, I literally knew instantly that this is what I had to do. I wasn't thinking about grants; I just wanted to do it. It was an interesting idea and I went and talked to people in electrical engineering, and asked them how they did this picture.

FREEDMAN: This was at OSU?

CSURI: Yes, all at OSU. As I understood it, and then the next week I signed up for a programming seminar, and began to learn computer programming.

FREEDMAN: So, how long were you taking programming?

CSURI: Well, I took computer programming for several weeks, and then I got involved right away. But, I was also very fortunate in that there were many people around that were very intrigued with what I was trying to do. It was such a revolutionary thing. Such a crazy thing. So I got a lot of help. I mean there's no way I could have done this by myself. There were just tons of people who have helped me in my career.

FREEDMAN: So you started out by, or is this always the case, that you were working jointly with a mathematician or programmer or, you know, your work is... This may be another thing that computers changed in our thinking about works of art, that they become group projects, more like a film.

CSURI: That's a good question. I think that it was more true years ago and becoming less true today. I think that as you get commercial software, and as artists work with packages, then credit is what the artist does with the software, and what do you do: credit a hundred people who developed the package? You know? Do you credit, maybe this is an over simplification, but if I'm typing a novel do I credit everybody who manufactured the typewriter? But I think in my case because I was so involved in basic research, it involved many graduate students and staff, that indeed credit

had to be shared. I think that even today in the research side of the house credit is shared. I think as an artist I sign my pictures by myself, and if anybody asks me how I did them and what made it possible I certainly wouldn't be hesitant to tell them who all may have been involved. This is more true early, early in the career, it's less true today.

FREEDMAN: That's very interesting. I have to ask you one more thing that I didn't think of at all until you read your statement. What would you say the relationship between computer graphics and conceptual art is? Or is there none? I'll give you one example that I've talked about to my students that might help, because it's a hard question to ask and a hard question to answer I think. The issue about what actually is the work of art when it's not made into hardcopy? Is it the image on the screen that can be turned off and therefore is time dependant? Or is it the program? Assuming that one person has written the program, and made the image, not used a software package.

These are conceptual art kinds of questions. Is it really the script of the program that's the work, or does the work only exist in time? I've had to talk about that with my students a lot.

CSURI: Well, let me make a comment. When I was in Austria, one part of the Arts Electronica Exhibition had to do with interactive systems. We just had several dozen pieces that were called that, that represented visual or sound systems, and you had a kind of context. For instance, there was this one more interesting demonstration where you had a bicycle and you had a giant screen - I mean literally as big as this wall - and you peddle the bicycle and there's imagery depending on whether you're peddling forward or backward. If you turned the bars of the bicycle, you would shift to the right or to the left, and so you're experiencing the art object, but the art object is some combination of this bicycle and your participation and your effect on the images and so forth. You have other environments, I'm sure you've seen them, where there's a combination of video and computer, where there's some images like a stairway, and people who are going up and down the stairs become a part of that environment. As games that are played with cameras and the kind of matting techniques that are done. I don't know how in the world to evaluate these things; how to apply criteria to that. Because part of the aesthetic depends upon the viewer's participation or involvement in it. I think that if I set that aside, my inclination is to look at a computer animated film, and what criteria do we bring to an animated film? How do we make judgments? To what extent we introduce some additional criteria through

computer art, I don't know. This is an open question. To what extent does the science play a role in this as well as the art...

TAPE 1/SIDE 2

CSURI: ...that is a factor in making judgments. As far as the art objects are concerned with still graphics, we haven't had a great deal of experience. I know that the object takes on one kind of meaning if you're looking at it on a small television monitor. I kind of doubt that you've seen this, but I've done some images that are 4 x 6 feet. It makes a tremendous difference; the impact is amazing. It's not the same thing at all. I've had people look - I've only done one, I'm about ready to do a second one of that size - and, the reaction of people is very remarkable. They're stunned when they stand in the presence of something like that. It pulls you into the space more. Your whole relationship to it is very different. So, I'm inclined to think that there are many aspects of traditional, more conventional criteria - I don't know what that means either - that you've applied to the work of art. But you can think of still graphics as images. I mean, you can't say it's a painting, you can't say it's a drawing. We're talking about cebachrome. But then other artists are taking printouts from the computer and attaching it to sheets of plastic or masonite in strips making a big image then laminating it, and saying this is the art object. You know, the things that are in the Hopkins Gallery, well, those are okay, but it would be so much better if they were higher resolution, if they were bigger, if some of them were, let's say, cebachromes mounted onto plastic and having light in back of them, you see. They would have a very different kind of impact. Right now I'm thinking of doing some images 8 x 12 feet. But those would be 8,000 line resolution, and they will absolutely give you the same kind of clarity that you will see on a small screen.

FREEDMAN: Even that large?

CSURI: Because we calculate and we put in enough pixels and the resolution is there. I think when we start seeing something that really has scale, it will make a difference in the way it's perceived. I'm not saying that's all, it's not that simple minded. But I think that still graphics people think of photographs or television monitors and that's it... I'm sort of getting off the topic a little bit...

FREEDMAN: That's okay. I'll maybe just ask one more question along this line. I suppose one advantage of using the screen is that you can do interactive stuff. You can actually have the audience participate. Have you done work like that?

CSURI: Oh, yes. I should give you a copy of a brochure of an exhibition I put together here at Ohio State called "Interactive Sound and Visual Systems." I did in it 1970.

FREEDMAN: I'd love to see that.

CSURI: You have a copy of that?

FREEDMAN: No, I'd love to have one.

CSURI: I think this was before most everybody was doing anything like this.

FREEDMAN: I think so, if it was 1970.

CSURI: I had computer music. I had people build special devices, like potentiometers that you could grab and you would have an oscilloscope with graphics and as you moved your arms, it would change the image. One of the more interesting things I had was four slide projectors that had like 88 or 100 images in each carousel and you sit there at a keyboard and there's a giant screen and each slide projector represented a quarter of a screen. What was interesting was that you could sit there and play and juxtapose different images together, okay, and much of that was random and accidental, but there was a kind of sense of playing with imagery, okay. I had a guy build a toy, an electronic toy, about this big, like a transparent case with electronics inside with buttons all over it.

FREEDMAN: About a foot square?

CSURI: He made it for his child. When you pushed buttons it would make bird calls, and it would do all kinds of crazy sounds, okay, that was an art object. Things like that. I had an interactive computer graphics system in the art gallery in 1970. That same graphics part of it was then put on display at the IBM gallery in 1971, 1972 something like that.

FREEDMAN: So people weren't doing many interactive...

CSURI: No. You didn't have the technology, no. It wasn't there.

FREEDMAN: I would have thought that would have been really early from my reading.

CSURI: Well, I think there was the EAT stuff in New York, which was the late '60s, I think. There were experiments with video, I'm not saying there weren't people doing that. I think computer related activities interactively was pretty minimal.

FREEDMAN: When would you say that really took hold?

CSURI: The '70s.

FREEDMAN: Mid-'70s, maybe?

CSURI: Yes. There could've been, it's very possible and more likely, that there were a number of people around the world that were doing things at the same time. But it was not a community, certainly.

FREEDMAN: I need to shift gears a little bit. I want to ask you about the development of your projects here. You mentioned that your first funding came from NSF, is that right? And they've been very supportive over the 20 years

until university funding came in. You started talking a little bit about it in your introduction. What was the debate, actually, about them funding you?

CSURI: The question is, is it science? What business does the National Science Foundation have in supporting an art project? Here was an artist who had no credentials, formal credentials in art, coming to the National Science Foundation. NSF has a mandate to support science. How will the scientific community perceive such an award? How will Congress perceive such an award? So I think initially while there was no problem... To give you an example how sensitive it was: we got the call that I got the award, it was a 100,000 dollar grant, we're talking about 1968, '69, it was a tremendous amount of money, and I was so excited that I couldn't believe it! I got a $100,000! A friend of mine made a gold placque that said 'I got a $100,000 from the National Science Foundation'. It was funny, and I wanted to broadcast it to the world. But then the National Science Foundation told the university not to publicize this. It did not want any publicity. They believed in it; they wanted to support it, but they were... Part of the debate, you see, in the peer review process, and debate within the Foundation itself, had to do with the fact that I was an artist, and what in the world is the National Science Foundation doing in the art game. They finally decided that it was important that somebody start demonstrating that this has important implications for the Fine Arts. So, they really took a risk on me in doing that. Well, it became very clear to me that if I wanted to get continued support from the National Science Foundation, I had to shift gears. So, the next proposal I wrote, it was nothing to do with the Fine Arts. It did, but I masked it, you see. I talked about graphics algorithms; I talked about rendering; I talked about animation - time-defended phenomena - that sounds better, doesn't it? (Laugh) That's the kind of language I learned to use. I had friends of mine in science that helped me put the language together, so it sounded like more legitimate science. I was still interested in the science part of it, but to me it was always a means to an end. Because I did that, we were able to do research that was the best in the business, where we competed very well with the scientific community. Then it gave us credibility, so the next grants were easier.

FREEDMAN: When was that second grant?

CSURI: I don't know, I'd have to look it up. The grants were usually two years, once in while you'd get a three year

grant. They were usually two years in duration.

FREEDMAN: That first grant was what set up the future of ACCAD [Advanced Center for Computing - Art and Design]? Is that correct?

CSURI: Well, I think the funding and my record in acquiring grants contributed greatly to the establishment of ACCAD. That's a true statement. There would never be an ACCAD if I had not received those grants. In fact right now, some people might be getting annoyed with me because I'm not working particularly hard to get grants, even though I could go out and get a lot of money. I'm not particularly getting exercised about it.

FREEDMAN: You've had so much for so long. You've been so successful in that.

CSURI: If you will look at the research foundation report they published this year, I don't know if it's '87 or '88, the awards in the College of Arts, there were 12 research grants for faculty. I got seven of them. Okay? Seven grants. So, in the arts there's practically no one. Because, you know, they don't have the options, you don't have the funding agencies for computer graphics. If you get a $5,000 grant, you make an announcement. Some people even publicize if they got $150 for something. If you get a $30,000 grant in the College of Art that is spectacular. But it's the nature of the beast. I mean, the National Endowment for the Arts doesn't have money. The Getty, you know, they're not interested in stuff like that. The Department of Education, forget it. They're not going to support graphics. Even computer graphics in schools, they're not going to support. So, there are very limited options in terms of where you can get your funding, and I knew that, and I had a good thing going, I had credibility, and I worked very hard to maintain a position as a researcher. There's a kind of politics involved, too, in that you really need to get to know who are the top researchers, because you know, only too well, that they're going to be your reviewers on your next grant, and they know I'm going to be their reviewer, you see? I don't have any proposals pending, but right now I'm very involved with the 30 most credible people... I'm part of the group. I'm on the advisory board of a prestigious publication, IEEE Computer Graphics and Applications, and I'm on the Board of Directors for the National Computer Graphics Association. But there's a kind of politics that's built into this whole grant thing

that's just the nature of the way it is.

FREEDMAN: What's your, as well as your political relationship with these people, what would you say your intellectual relationship with them is? Would you say, for example, any of them have particularly influenced your work? The people in the sciences. You spoke a little on how artists influenced you.

CSURI: From an artistic point of view, no. But on the other hand, they certainly influenced my thinking in terms of research topics that come up. Let me give you an example. Recently I had to review a paper on three-dimensional painting technique. Now, what we're talking about is looking at a stereo pair screen (?) and being able to grab a brush and literally draw in three-dimensions, paint in three-dimensions. It's like sculpture. But, we're talking about paint marks in three-dimensions. We have the technology to do it. We have a device here that would enable us to do that. Well, he's made limited progress. It's a paper and work-in-progress. It's a short paper and so I think he'll be encouraged to submit a full paper for a conference that takes place next year. And I'm sure this guy is a very credible researcher, that he will do something interesting. Well now that I know that's possible, we will do it here, but more importantly, I'm beginning to think about image making in ways that are somewhat different. I mean try to do that with traditional media. That's an intriguing thing to me. Where I may have a brush mark going around your face, that blocks part of your face, but I can see the back of the brush mark behind your head. I don't know if that's interesting in and of itself, but the way I might be able to write a word in three-dimensions, or make an icon that's three-dimensional, that's part of a solid object, a head let's say, that's related to it somehow in terms of the symbolism and so forth. So, now that's an instance where research activity influences the kinds of ideas I come up with as an artist. But I would say, most of the time, that is not the case. The kind of issues that researchers deal with are so basic, like how do I develop a technique to make something look like this table or this woodgrain? There's a preoccupation with realism, photo-realism. Or in the case of animation they're trying to, as we are here, come up with algorithms to determine how the body should move . Those kinds of things. Well, I'm interested in that, but I'm much more interested in the algorithms and the techniques, and I don't want to do realistic people moving. I want to do some abstract shapes that are in motion. I want to think of it in a more expressive way. But in order to do that I need to understand the technology. So I suppose in that regard it stimulates my thinking. I mean, it's important that I

understand the graphics algorithms and how they work, and as I understand them, then I can think of ways of using them artistically that the researcher would never think of.

FREEDMAN: On the technical issue that you just pointed out, what would you say the most important or influential developments in graphics, historically, have been? If you had to just select three or five or so, things that you think have been the most revolutionary.

CSURI: Well, I think the ability to create photorealistic pictures. I think to represent objects...

FREEDMAN: You mean through programming or digitizing?

CSURI: Programming. In other words, the algorithms where you can create objects, that's one aspect. But then where people have come up with solutions that deal with perspective, with lighting models, with color, with transparency, material types, things of that nature, where we have the ability to literally represent a physical universe very realistically. I think that has to be a very significant development in computer graphics. Then other things would be data generation: how to make objects on the computer, working with primitives or with some special construction techniques to make objects. And... animation, of course. The algorithmic control over motion, where you don't simply think about motion like a conventional animator, but you have some intelligence built into the computer that solves many of the more tedious problems for you. Those have to do with computer graphics, but I think that from an artistic point of view I'm not sure how to go at that. That's a little different.

FREEDMAN: Are there hardware developments that you think have been particularly revolutionary?

CSURI: Well, certainly the frame-buffer. That's the device that has the memory and video connected together that allows you do display a picture. I think that was a very significant development. I think probably special input devices, digitizing tablets, a three-D digitizing device, special scanners of a type for example, where you can be seated in a chair and there's a device that will swing this arm around in space and it will bounce a signal off your

head, and essentially it does a contour and then moves down and it's like doing slices through your head and body. Then with software you can create polygons that connect them this way (?) and gives you the surface geometry that makes a very realistic image of you as a portrait. Have you seen those things?

FREEDMAN: Not three-dimensional.

CSURI: I've used some of those objects in some of my art work. That's a very important development, because it makes it easier to capture an object, and to come up with things that are interesting. I'm dying to have a self-portrait made of my own head. Then I can do all sorts of silly things on my own face. I'm my own teacher, you see. I could have a tremendous amount of fun playing with self-portraits.

FREEDMAN: What kind of software has been developed here that has been particularly influential would you say? I mean, I know how your work influenced the way people think about computer graphics, but I don't know so much about the actual software that's developed here.

CSURI: We've had a history of developing our own software. We rarely use commercial software, although that's beginning to change. There are certain types of software that we're anxious to work with. But right now, we've developed data generation, animation, rendering, we've done everything ourselves, and are still doing it ourselves. Today, we are working on an image processing package that we think is going to create a real problem for departments of photography. It's going to eliminate the need for chemistry. Once that gets out there and students start working with it then departments of photography are going to be in real trouble, because it will be so much easier to do all sorts of interesting transformations on a photographic image. We're, right now, doing something that's quite - I don't know whether to use the word revolutionary - but I think very significant, in that we are developing graphical programming techniques. This is coming out of the project dealing with visualization and scientific computing, where instead of typing in code, you actually grab icons that represent computer programs and you can place the icons on the screen and indicate, this is the first step, and now I want an arrow to go to the second step, the third step, fourth step, and so on. Scientists go through a number of processes to look at their data.

Technically that problem is a rather difficult one to solve, but we think this is going to have very important implications for the fine arts. Because what it will mean is that it will be much easier for artists to actually work with computers, like in image processing. Let say, I've got a photograph. Now I first would like to do something with contrast, then I want to make it look like a painting, I want to convert it to brush marks. Now I'd like to combine that image with another image. There's just a number of things I want to do, and all you would have to do is just position those icons in the screen and the programming knows how to connect these things, the code will make it work and then it's almost like pushing buttons. Then you get out of it the image, okay, and then you can say, well, I think I should do this step first, and you switch these things around. You can come up, let's say, with your own style, if you will, your own technique based upon how you combine icons, so every time your images have a certain kind of look. This month I'm going to make them look more like an impressionist. Whatever, you know? I think that's a very significant development, and it's going to have a very important effect on how children will work with computers. I think there are many things... I don't want to say that that's sort of a panacea to solve all problems, but what it does mean is that you can do a great deal of productive work by using this method. And it will require that you know even less about computer technology to be able to do something with it. I think it's always better if you understand what's in back of it. But these developments we're doing here we continue to do that, we've had a history of doing it. In this environment, you would have a very good relationship between the technical people and the art people. So there's a great deal of interaction and an influence on the way that software is often put together, and some of the features in software that will need some fine arts requirements that you're not going to find in commercial software.

FREEDMAN: Could you talk a little more about that influence between the scientists and the artists? Either here particularly, in the past, or in general.

CSURI: Well, I can only talk personally, so it might be better if I do it that way. I'm very fascinated by the kind of computational models that the scientists have. I mean, they're trying to look at behavior, let's say behavior of fluids or molecules or whatever. And what's generally associated with that are let's say in fluid mechanics, if I may use that as an example, is time-dependent phenomena. I mean, there are physics built into and the fluids will behave in a certain way depending upon whether it's going to hit this, or my glasses, or air moving over this, or whatever. I think

what intrigues me is that often those things are really interesting visually, and I'm interested in taking, let's say, coordinate information, and you can describe this sort of phenomena as polygons in three dimensional space, and the coordinates in space. Now, I might decide to link that to some objects that I'm working with as an artist, and there's a kind of organization, there's a kind of pattern that I think is interesting, and it's probably a lot more interesting than what I can think of, okay. Also, if I understand the model, and the parameters that control the model, I can use that as a way of applying transformations to some problem I'm trying to deal with. So it introduces some possibilities for me that I ordinarily would not think of. I might, let's say, take a hurricane model, and I'm not going to do it completely in three space, but I may want let's say 50 objects that I'd like to have positioned based upon the movement of the hurricane model, let's say. I think that's kind of an interesting way to put these objects in three space. Or there could be something in the scientific model that influences the decisions I make about color, or something like that. I think as an artist, I'm always looking for alternative ways of looking at the problem. I'd like to have other solutions. For me, scientific models is an interesting way to look at the problem. It goes back, I suppose, to my interest in the Sine Curve, which is a computational model. It is an algorithm, a simple one. But now since we're so involved in supercomputing around here, visualization and computing, and because we have certain common data formats, and this has to do with the computer graphics software, that we can take the scientists data and convert it to a visual representation almost in a trivial way. It's like going into a candy store for me. It introduces all kinds of possibilities. There could be aspects of the hurricane model that could be fed into something I'm trying to do with motion, but it's not exactly literally the same motion. But I can use those parameters. I can use those coordinates, and the way the positions of some element in the model move over time, I can apply that to how color might change over time in my object. But you do not see literally a hurricane in my database, but the color is being shifted because of the way the hurricane model works. Do you see what I'm talking about?

FREEDMAN: Yes. Let me ask you another historical question. Lately I've been reading, on the science side, about historical developments in computer graphics. Are there any particular projects or people that you think, even if they didn't influence you directly, have been as influential as you in the development of computer graphics?

CSURI: Well, I think I've been... I don't know if this is what you mean, but there is some very interesting work that

has taken place at Cornell and at Ohio State involving a radiocity algorithm, which measures energy of light, and gives you another level or realism that you can't get by the typical algorithms we use, which gives you soft and harsh shadows, gives you reflected color, and truly looks like a photograph.

FREEDMAN: When did that work get started, do you know?

CSURI: Gee, I can't give you an exact date. I would say eight years ago, maybe.

FREEDMAN: So it's been a while.

CSURI: We have the algorithm working here. Steve Spencer, one of my staff people, did his master's thesis on it. So what we're doing is taking... What he in his computation comes up with an illumination model of shadows _____ and so on, and we're passing it to another algorithm, so we're combining it. One of the problems with radiocity is that it's so computation expensive. It's just horrible, it takes so much time to get a picture. So we're trying to find shortcuts to do that. I think that's one of the more interesting ones. It's hard for me to come up with many, because we sort of have been the center of the research activity ourselves, and we've pretty much done what everybody else has done, and we've done it first. But we don't have as much development in this particular area as the people at Cornell. This is how they made their reputation.

FREEDMAN: What about things like texture mapping and bump mapping that you were explaining to me the other day? Where did those originate, do you know?

CSURI: Oh, that's stuff that Jim Blynn (?) may have done there.

FREEDMAN: That seemed to have influenced the work that's done here.

CSURI: Yes. But we did it as early as anybody else. In fact, we're probably doing it better. The particular technique

that we .... I think the people at Pixar have had what is considered the most advanced algorithm called Render Man.

FREEDMAN: Yes, I've heard of it.

CSURI: But it's computationally very expensive. We're coming up with a new algorithm we think will surpass it, using some new techniques. But this is being driven, in part, because of artistic requirements. So that I'm having some influence, and also the people on their own are thinking of some interesting things that would help the artist. The scientists are perfectly happy with what they have now, but we want to do something that's better for the artist. So that's under development now. I think by the first of the year it will probably be available.

FREEDMAN: It seems that, even though the scientists and the artists use the same hardware and software, and therefore sort of moving in similar lines in some ways, there's always divergent paths. You have so much influence on the artistic end of it, do you find it easy to deal with scientists? Is it difficult to try to talk to them about what you want to do, when you need their advice on something, for example? Or when you were working with the mathematicians, and programmers early on in your career?

CSURI: I think we have a pretty good idea of what a scientist wants, and what they need, and in many respects their problem is easier than what artists want. It's a little more straight forward, and they're perfectly happy with a representation of their data that's not nearly as complex as what an artist might require. Part of the problem with the scientist is really trying to help them understand how they might be able to get more insight into their model if they worked with other kinds of vision cues. Because they generally do not have the visual sophistication. They don't have the background and training in the visual arts, and it really limits the way they think about how to represent the models. Once in a while we'll find a scientist that's open to suggestions, but it's really quite difficult, because they're quite convinced that they know what they want, what they need.

FREEDMAN: So computer graphics sometimes, like in art, can actually show them things that they couldn't imagine.

CSURI: Oh, yes. That's the whole point of it, you see. The thing is, you get into some really complicated problems that are very hard to understand mathematically. Let me give you one that was described to me recently. I'm sure you've seen this; where you have an ashtray and there's a cigarette sitting in the ashtray, and smoke that goes up. At the top it begins to break apart. But then there's apparently what they call transition from the stable, then it begins... They don't know what happened. They don't know what causes that. By coming up with, let's say, some experimental techniques combining computer graphics, they might get more insight into the behavior. Getting more insight based upon visual cues. I mean, the graphics, let's say, you may have color coding and that's obviously the link to the computational model. But as you see the interaction of the color and their positions in space, it might give you some ideas about how to explain the phenomena, you see. I think the whole point of visualization, really, is to provide the scientist with graphical tools that are highly interactive, easy to use, so that the graphics really improves the science. It improves their model. That's a key notion. So the computer graphics is not just simply for presentation, for marketing purposes. Although that is important when you go into agencies and you're trying to show people what you're up to. But from the point of view of scientific research, we think it can have an impact on the scientist's way he thinks about models.

FREEDMAN: I think that that, in some ways, changed some time in the last 20 years or 30 years from the beginning of computer graphics to now.

CSURI: What I'm talking about here has been a development that's more recent than that. I'd say within the last five years.

FREEDMAN: Really?

CSURI: I think some people have known about this. I mean, I've known about it, and colleagues have known about it, the graphics community. But it's only been relatively recent that the scientists, a few, it's still a problem, say, "Yeah, that may be right." But you see, there's still the problem in that commercial software does not give you that capability. We think that in this building we're developing software that will allow the scientist to do that kind of

experimentation. I don't think it's generally understood, or believed, but I think we're beginning to convert a few scientists around here, and as our software gets better, we think it will be there within a few months, we'll probably come up with more compelling demonstrations. The hope is that we can make scientists cheerleaders.

FREEDMAN: Let me ask two questions that I need to get in as our time is running out here. They may be connected, I don't know. One is, what actually stimulated the development of ACCAD itself? The other is, what stimulated the development of the Cranston/Csuri Productions?

CSURI: We had the computer graphics research group for ACCAD, and I had one or two people that were funded by the university. The rest of the support came from external grants. I kept talking to my dean about having more of an interdisciplinary organization, and it came out of my lobbying for something like that, and having enough influence with the president of the university, and the vice-president of research, that eventually persuaded the dean to risk it, and do something about it. I think the other thing that is a very key development is the academic challenge award. We wrote a proposal to, it was routed through the College of Arts, and then it was reviewed by central administration in the university before it went to the Board of Regents. The academic challenge was a proposal for an interdisciplinary research activity involving development for industrial design, art education, and photography and cinema. We made the case for approximately $200,000 a year for six years, $1.2 million. The academic challenge, what that means, is that after six years the university agrees to pick it up, and make a continuation budget. I think that it's a combination of the idea that we had, but, ultimately, the resources had to be in place. This furniture, I had to make the case to central administration to buy us new furniture. We had no furniture. They gave us $210,000 for furniture. My office has $20,000 worth of furniture - it's disgusting. But, we had an opportunity, okay, and they were very anxious to do something in this high-tech corridor; something that looks like it's state of the art, and we were able to ride in on that. The visualization laboratory we just put together at the front of the building on the right as you walk in, is done intentionally to make it high-profile. It's a combination of all those things, and over the years I built up enough credibility that I was able to have influence on making it happen. This had to happen at a top level. It would never happen through art education, or any other academic department. They would have killed it. They would never let it get out the door.

FREEDMAN: Who funded the first six years then, before the university takes over?

CSURI: That's the Board of Regents. That's being funded presently, we're in our second year. So we've got another four years before the university is obligated to fund that. What's involved there is three full-time people, $50,000 a year for equipment, plus money for supplies and traveling. On Cranston/Csuri Productions, I thought I was going to become a millionaire. I mean, why do you go into business, you want to make money. It did very well for about seven years, six years, and the last year it was closed down.

FREEDMAN: What year did it start?

CSURI: About 1980, 1981.

FREEDMAN: What was the original objective, or intent? Was it to handle your work?

CSURI: No, no. Commercial television. You probably saw some of our stuff on the air for years but didn't know we did it.

FREEDMAN: Oh, I have.

CSURI: ABC, NBC. The ABC Globe, we did that seven or eight years ago, and it's still on the air. Many commercial clients. TRW, there's one that we did scrubbing bubbles that's still on the air. We did a television series called "The Living Body" for the BBC, 24 television programs, four minutes for each program. You know, stuff like that. It was a company that was very successful creatively and technically, but the principal partner that I had had a different philosophy, and wanted to continue in that direction, and I could see the signs, I could see problems. I was trying to persuade them to go into software, sell commercial software. Unfortunately they wouldn't. It got over-extended and ran out of money.

FREEDMAN: So that was disbanded?

CSURI: Yes.

FREEDMAN: Was that last year?

CSURI: Between two or three years ago.

TAPE 2/SIDE 1

CSURI: Well, I can only talk about that personally. We're in the middle of a debate about creating a new academic division. It's very important to me. We had a meeting of all the visual arts chairs, and the majority of the people felt that we should look at a new academic structure. I believe this is what's got to happen, because otherwise there would just be a constant series of battles, and really strong differences of opinion, and budgetary problems, tenure decisions, all of that involving the faculty. Art Education is not the proper place for us. It's just ridiculous that we're in Art Education. I am very interested in production. As an intellectual, I'm interested in teaching, and many of the issues art educators are interested in, but I just simply have a higher priority for producing art. And also, I'm more interested in a different kind of a division. You see the division I imagine could one day offer a Ph.D. in computer graphics. It could be comprised of faculty members who have a Ph.D. in computer graphics, MFA in art, somebody with a background in bio-medical technology, somebody whose special interests are in visualization, and somebody who might be interested in interactive systems and instructional technology. I would like to see a truly interdisciplinary department that would attract students from a variety of backgrounds. It's the nature of the beast, it's the nature of ACCAD. I think that model has worked very well and I want to see that expanded and have much more of an impact on the instructional program. I don't know. At this point it's very political. It also has to do with economics. The visual arts chairs are very threatened. They're very fearful that we will take off like crazy, and I believe it would work. It's clear that some of them are trying to prevent that. A lot depends on what the dean finally

decides. I think if it gets out of the office of the dean, it's a go. I think we'll get it, because I think I've got everything lined up at the top level. Personally, I don't know in terms of my own work.

FREEDMAN: You seem very excited about your work right now.

CSURI: Yes, in my own work, I had a great visit in Rome with a very well known art critic by the name of Professor Mauritzio Calvese(?). He's very well-known by art historians. He is an art critic, but he's more of a scholar, classical-type. He's written about Pop Art, about Picasso, Caravaggio, about art and alchemy, you know, stuff like that. He's seen my work and appears to be very impressed with it, and said that he's going to write an article about it. If that is the case, it will be the first time that anybody at his level will have taken computer art seriously. It turns out that his wife has just been appointed the director of Italy's Museum of Modern Art, and she's trying to find a way to give me an exhibition. That would be lovely if that were to happen. I don't know. I'm putting more of my time and energy into Europe, and the possibilities in Europe, and of course, I've got to finish art work. I may go after another research project involving visualization of scientific computing, more for political reasons than what I personally want to do. In many ways I'm working for nothing in the university in terms of my benefits for retirement, and there's a part of me that says why don't you retire. On the other hand, I would like to play it out just a little further. I think I would feel much better if there were a new academic unit. That would be terribly important to me. You see, I think that the arts have got to deal with this. I keep talking to people about the demographics of what's happening in higher education. They don't want to hear this. The fact that the number of available 22-year olds has been dropping since 1983, for graduate education. Today we have between 12% and 15% of our population is minorities, roughly 85% are white or white/asian, I guess. By year 2000, my friends who do demographics tell me that minority populations will be 35% to 40%, the white roughly 60%. And if you look at the drop-out rate of minority students which is horrible by the time you get to high school. Unless we almost instantaneously find ways to solve these problems, we're going to have fewer graduate students by the year 2000 available. There's no talent pool out there. It depends on who you talk to, it could be 20%, it could be 30%. Others who are skeptical that any of this will happen. I think it's sheer foolishness not to take this seriously. Well, I think that what's going to happen is that in this country we're going to have a two-tiered university system. We're going to have about 40 research institutions, and the rest of them, fine, they're going

to involved in teaching more. But, the basic research, advanced projects are going to be done in fewer and fewer places. I feel that if the College of Arts does not start putting in place, almost immediately, some sort of strategic plan about what they are going to do to face this thing, what should happen in the arts, they're in deep, deep trouble. I think that there's got to be more of a concern about interdisciplinary activity. They've got to bring some innovation and imagination to the table in some way. I'm very skeptical that this will happen. I don't think people want to believe this. They don't want to deal with it. Perhaps, more importantly, they don't know quite what to do, because how do you go to a faculty, an art department, and say, "Fellas, we're going to be obsolete if we don't do something." What's going to happen is that as the graduate enrollments are reduced, fewer faculty will be required to teach at the graduate level, there will be cutbacks, and the more vulnerable people will fill those positions that represent non-tenure positions. I know that's a grim picture, but I think that's what many people believe is happening. And you certainly can see what's happening to our economy. I mean I've never been in a university in a time when there's been such a pre-occupation with money. Money, everybody is complaining - not enough money for travel, we can't do this, we can't do that, and we're getting nickeled and dimed to death everywhere you turn. But it's not only true in Ohio State. It's true at the University of Michigan. It's true at many institutions. Somebody's got to take more of a leadership position and really make some decisions about which way we're going to go. I don't know whether the College of the Arts will do it. I'm very skeptical. This is also very true at the university. We need a president that's going to really say some things and really mean it. We need a government. What can I say?

FREEDMAN: Yes. It reflects the times.

CSURI: It's just a very, very strange time that we're in. It really is. I don't know that what I have in mind will make it. I'm very worried about it, because the timing is not good. Because what I want to do, and what I think needs to happen requires resources. It means taking money away from somebody and giving it to us. There's not going to be any more money.

FREEDMAN: That's for the reorganization?

CSURI: Yes.

FREEDMAN: Could you say, in closing, anything about the artwork that you're working on now. As you were saying in the beginning, this is sort of a renewed interest of yours. Do you know what direction that will go?

CSURI: Well, no, it's hard for me to say. I think I'm still learning, and I think the area I'm most concerned about is at the level of the idea. Trying to decide what is it that I want to do. I'm not impressed by the technology; I've lived with it a long time. You know, big deal you can do transparencies, you can do a four thousand line image. In the context of working with subject matter, this is what I'm trying to deal with. What sort of symbols have I worked with, and what am I trying to say. I can't think of it as a plan of action, just simply as a concern, and really, perhaps, looking a little more carefully at images that I do like that other people have done. Photographers, for example, if I find a good source, well, why do I like that?, what works about that, as a subject?, why does that work?, you see. So, that's a very high priority in my own thinking. Where that will take me, I don't know. I don't really think I need many more tools. I need better ideas.

FREEDMAN: Thank you.

END OF INTERVIEW