An Interview with

RANGACHAR KASTURI

Conducted by Jeffrey R. Yost

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Abstract

In this interview past Computer Society President Rangachar Kasturi (2008) begins by briefly summarizing early educational interests as well as his completion of an engineering degree from Bangalore University. He recounts his subsequent work in industry and a major science museum in India prior to moving to the U.S. to complete his Master's and doctorate in computer science at Texas Tech. He then took a faculty post in Computer Science at Penn State before moving to his current academic post on the computer science faculty at University of South Florida. He discusses his research in graphics recognition, leadership with the International Association for (Pattern Recognition) Graphics Recognition. The bulk of the interview focuses on his volunteer leadership for the Computer Society including serving as EIC of Transaction on Pattern Analysis and Machine Intelligence, serving as VP Pubs, and as President. With the latter he discusses policies with CS services and products, transitioning to digital products and revenue streams, facilities, and other topics.

Yost: My name is Jeffrey Yost from the Charles Babbage Institute at the University of Minnesota, and I'm here this morning on November 20, 2015 at the University of South Florida in Tampa, Florida, with Professor Rangachar Kasturi, past president of the Computer Society. Can you begin by just telling me when and where you were born?

Kasturi: I was born in Bangalore in India in 1949.

Yost: I imagine, quite a different place in 1949.

Kasturi: Right. Bangalore used to be called a retirees paradise and now it is the IT capital.

Yost: Right. I had the opportunity to visit there about six or seven years ago with a Management School group and visit WIPRO and some of the IT giants and IIIT campuses. Did you grow up in Bangalore?

Kasturi: Yes, I went to school there. My mother was a teacher and in fact, my entire family are teachers. My grandfather started a school, which is still running there; and my father and mother were both teachers. Then my father passed away very early, when I was less than a month old, and my mother brought me and my sister up in Bangalore. So going to school was almost a daily routine for me from a very young age. I started actually being in a classroom when I was just a five-year-old. That happened to be the fourth grade class, so I got a very early start.

Yost: And were there particular subjects that you especially enjoyed or had an especial affinity for?

Kasturi: Nothing in particular at that age. Most of the education at that time was in the local language, Kannada, and since my parents were very much interested in the literature; I did too. My dad had written books, particularly for children, and he had also written a book called *Illustrated Kannada Grammar* which became a textbook in the 1940s. So we were always interested in books and so reading books was something very common in our family. I didn't get to learn anything much about English until I got into middle school, where I started in grade five.

Yost: What year did you start at Bangalore University?

Kasturi: I completed Grade 11 (what was then called Secondary School Leaving Certificate (SSLC)), then we had one year of pre-university before starting engineering degree program. At that time, the Bangalore University was just being formed, so we started out with Mysore University, which then became Bangalore University in 1965. I started at Bangalore University in the pre-university classes in 1962 and I started engineering in 1963. We had a full five years of engineering. The first three years were

common between all the branches, mechanical, civil, and electrical. I started out with an interest in mechanical but then I finally ended up doing electrical engineering because I found it to be more interesting at that time.

Yost: Was there a computer center at the university at that time?

Kasturi: No, not only that we didn't have any computer science but there wasn't even an electronics option at that time. We all wanted to do electronics but Bangalore University didn't even offer it. But right after we graduated, the next year batch, they did have an electronics option. So I'm basically a power engineer, you know, generation, transmission, and all of those things.

Yost: And you completed your electrical engineering bachelor's in 1968?

Kasturi: In 1968, so I was about 19 years old at that time.

Yost: Had you given any thought to computers at that time?

Kasturi: None. Interestingly what happened was during those years, all the students were taken for a tour around India. Actually, they had two tours; one in the south India, one in the north India. And this was in the pre-final year; and we went to… India had just started exploring space at that time, mostly for weather radar, where there were sounding rockets and this was in the southern part of India. One of the special places that we visited was that rocket launching control center and the main attraction there was a computer that was, I believe, the first computer in India, which the space agency had bought. So after traveling for over 400 miles, and then we got to go inside with all the permissions, but then we had to see the computer — which was inside of a big room, completely closed up — through a little window because we were not supposed to go and change the temperature inside with all these 40 or 50 students going in. It was inside an air conditioned place. [Laughs.] Then we got a quick peek of perhaps a big cabinet sitting there. That was our first introduction to computers.

Yost: Upon graduating you worked in industry for about a decade.

Kasturi: Correct.

Yost: Can you tell me about the different positions that you had and what if any connection to computing there was?

Kasturi: Sure. By that time there was quite a bit of unemployment for engineers in India and then the Government of India used to offer a kind of graduate engineer training program. I got one of those things; this was a one-year appointment in a local company, which was a control systems company that was making switching gear for electrical systems. The company was called Mysore Electrical Industries, and there I got to play with some of the electrical hardware, using switches mostly, and relays that control equipment. That was the extent to which I was able to get in to electronics there. But subsequently a year later, I got a job in one of the largest electronic companies in India. Even then and even today it's one of the largest companies, called Bharat Electronics, and this is a Government of India enterprise, primarily a defense contractor. Their job was to build communication equipment for the entire Indian defense so we were working primarily designing communications equipment. Walkie talkies basically was what I was doing, and there were others who were also building high powered equipment and so on. So I started working in VHF at technologies in the 30-300 megahertz band, building small walkie talkies operating in that range. That's when I really got to work with electronics and that was very enjoyable. We had a team which was converting the old fashioned electron tube type of electronics circuit to change the frequency of the channels into digital systems. That was the first introduction to digital chips at that time, so we were procuring these from RCA, it was their early 4000 series CMOS chips which were just being introduced — this was early 1970s — which could do a number of digital functions, digital logic. And today I'm teaching logic design to the students here using similar logic gates. And as a part of work I traveled to different parts of India to prove that our equipment really does work when it was used in rough conditions by the Indian

military in the northern borders, particularly things like would it stand 15,000 feet of altitude, and would it work at temperatures going as low as -20 or -30 degrees outside air temperature. So I was actually to accompany my equipment to go to those places, so it was quite an experience working in high altitude.

Yost: And you were there until 1976?

Kasturi: Yes. So that was about seven years I worked there. I was always interested in teaching, in some form of teaching. There was an opportunity there for an attractive job, and also a much better paying job, from again, Government of India's science museum, which is called the Visvasvaraya Industrial and Technological Museum in Bangalore, which is still a very popular place in Bangalore. And this is a museum where, just like any science and industry museum — and many of the exhibits were built somewhat similar to the ones in Chicago Science Museum. . I was hired there as an engineering officer basically to build any electronics behind what the people get to see. That was fun, too. I still have here (shows a large schematic diagram)….this is one of the circuits of that museum; I still kept a copy of this since I designed it. And all that it was doing was playing Tic Tac Toe game. [Laughs.]

Yost: That's impressive.

Kasturi: So I drew the circuit and I had an assistant who could wire it for me. There were no printed circuit boards in that museum facility so it was physically bread board wiring. So whenever I talk to my students here about doing some bread board wiring in the labs, I say oh, then you can do this and show them the circuit!

Yost: We don't generally collect artifacts, we're focused on archives, but we have a few smaller things and we do have one of the memory panels from a SAGE Q-7 IBM computer and you can actually see the circuits. We've got it framed on the wall and you can actually see a bit of memory, which is useful to show students, being actually able to see an individual memory circuit on a panel.

Kasturi: So in fact in this circuit, I did not have any access to memory. It was not available to me and so that way I could not really program the various combinations of a real Tic Tac Toe game and so everything was actually sensed based on which buttons are pushed and depending on that, logic circuit would light up corresponding lamp. And then my curator said it wouldn't be very interesting if the machine wins all the time, so people would not play. And so I just made some more changes so that once in a while, person can also win so that we can attract more visitors - but to just add that complexity probably doubled the circuit. It was an interesting project. So I worked there for a couple of years and by that time, I was really interested in; as I said, I was always interested in a teaching position.

Yost: And also that early introduction to AI with games.

Kasturi: Yes. So I came here to the U.S. as a student, after I worked in the museum for two years, I got an opportunity for graduate studies with assistantship at Texas Tech University. I applied to a number of places and many places gave me admission, but Texas Tech gave me very good financial assistantship package, and so that's how I ended up there. And even there, I wanted to do some traffic control type of system, that was a hot thing at that time, you know digital control of traffic signals but there wasn't anyone working in that area at that time. I took a course there in electro-optics – which was one of the courses I took the very first semester. I didn't know what to take and by that time, I was already out of college for about 10 years, and so I didn't even know what were the current topics in the college. And also moving from India, the U.S. system felt so different.

Yost: Right.

Kasturi: I simply took three courses and one of them happened to be an optics-related course and that interested me, laser optics. So I ended up working with my advisor in

multiplex holography, again nothing to do with computers. So my MS thesis was in multiplex holography.

Yost: And then for your dissertation research you shifted to digital image restoration?

Kasturi: Correct.

Yost: Can you tell me how that interest developed?

Kasturi: So what happened, again, my advisor who advised me on laser optics, he also had funding at that time from Joint Services Electronics Program from the U.S. government, which is kind of an open-ended research program and my advisor was interested in image restoration, since he came from an optics background and much of what I was doing was with photographs. If you have photographs, they are captured in chemical medium, right? The film, and especially if you enlarge it a lot, then what that will result in is that the single grains of silver halides start showing up; so in the photographic film, which is made up of silver halide crystals, you don't really see it when you enlarge it up to a reasonable size. But if you have these things in a satellite, just capturing it and then you enlarge it a lot, tens of thousands of times, then it becomes a very grainy picture. That graininess is a function of portions which are fully exposed, which gets washed away, don't see anything; portions which don't get fully exposed, then these silver halides are still there, and then they are randomly distributed at different sizes. And so my advisor said… see that, what remains is a function of the amount of light, and light is our signal, and so it is signal-dependent. But most of the noise models people using are signal-independent noise models. Anybody who does photographic image restoration, are treating the noise is independent of the signal, but here we have a model which requires signal dependence, so you go work on that problem. So that's how I ended up in image restoration for my thesis, but we didn't do much with photographic film, *per se*, but was working with signal dependent imaging models. That was the first time I was working with image processing and analysis.

Yost: And J.F. Walkup was your primary advisor?

Kasturi: Yes.

Yost: Can you describe him as a mentor?

Kasturi: Dr. Walkup was always an excellent mentor, he encouraged us to do things and then he would just have weekly meetings with us. His classes were also interesting, in fact, many of the things he taught me I still use in my own courses. His true/false questions were always challenging - you know that's where you can really understand whether the students learn the concepts very well - you don't have to give very long detailed problems. He was also an excellent mentor and a very family-oriented person. For me, coming from India to Lubbock, which as you may know there isn't anything much around there for hundreds of miles [laughs]. So it was a good place to get an education. My department head was also — his name was R.H. Seacat — and he was also exceptionally great person, and he saw my interest in teaching, and as a graduate student he allowed me to teach very advanced courses.

Yost: When you entered graduate school were you thinking of an academic career?

Kasturi: Yes, I was interested in an academic career; in fact I didn't apply for anything other than an academic career.

Yost: Did you become a member of the Computer Society while you were a graduate student or did that come later?

Kasturi: Actually at that time, as a graduate student, I became a member of the Optical Society of America, OSA. I'm not a member of that anymore because I don't do much work in the optics area, but my very first paper was on this multiplex holography, at an SPIE conference. And then follow-up papers were at Optical Society of America conferences. So I was a member of that and then when my Ph.D. based papers got

published, I had a paper at the Computer Vision and Pattern Recognition Conference. That was the first CVPR conference [and] that was held as an IEEE Computer Society conference. Before that, the CVPR conference was known as PRIP, Pattern Recognition and Image Processing. And in 1983 for the first time it became CVPR, and as you may know, today CVPR is the number one conference in terms of its impact. It is the largest Computer Society conference other than the SC, (the High Performance Computing Conference). The CVPR is the next largest and also extremely high impact factor.

Yost: How many people attend?

Kasturi: Today CVPR attracts 2,000 people or more. First time it was very small. I still remember that one in Washington, D.C.; the very first CVPR event, my talk was very early in the morning, there were not enough people so it was practically me and a few others who were there. Since it was D.C. I had taken my family for sightseeing, I told them you can come and sit too because the room is empty and you can see what I do [Laughs.] My mother and sister were visiting there, so they all became the audience. Today, if you go to CVPR, there is just no room in those sections.

Yost: As you completed your doctorate, can you tell me how you went about your job search and ended up at the Computer Science and Engineering, EE department at Penn State?

Kasturi: A strange thing that happened to me is that I was not expecting to graduate that early; I was expecting that I would need another semester or more before I could finish. This was in 1982. I was in my Ph.D. program only for about two years and then I knew it usually takes more than a year just to find the topic and get going. So I had just started working on this topic for about a year or less, not that much, but it was very interesting and I thought maybe I was very lucky to be able to get a substantial amount of progress made in that area in a number of different threads. A point came sometime early in the summer of 1982, around that time, and my advisor said you do have enough things to write your dissertation. So I started writing up at that time, and then also I was taking

portions of that and creating journal papers for submission. Eventually, I ended up publishing five journal papers out of my Ph.D. work, and a few conference papers. So he said this is substantial work and you can really defend at this point. But I didn't have a job so I started quickly looking for a job. I think in July I started sending out applications to five, six places and Penn State was one of them; Caltech and a few other places. My first interview was at Caltech and I went there for an interview and came back; and then the next week I had an interview with Penn State, and then Penn State offered me a job right away, pretty much within a day or two after going there. Then I called Caltech [to find out] if they were going to make any decisions soon, and they said no, we just got started; we need to interview five more people; by this time next year, probably we will decide; not so soon. [Laughs.] And so I thanked Caltech for the opportunity, and I took the Penn State job.

Yost: Can you describe the department at that time?

Kasturi: At that time it was a… I went to the electrical engineering department and we did not have a computer engineering department at that time. There was a separate computer science program in the College of Arts and Sciences; maybe the College of Science, so there was not much interaction between the two groups. So I was in electrical engineering, I was teaching core electrical engineering courses. I started offering graduate courses in my area of image restoration. We had a new dean at that time, he was there a couple of years before I went; Wilbert L. Meyer, he was a very forward looking person and then he wanted to start a computer engineering program. He hired Professor Tse Yun Feng to develop the program - he came to Penn State, but by then he had already served as the president of the Computer Society. So he came there in 1984 and then I had an option either to stay with the signal processing group or go with this computer engineering group. In my life, I always take on something which is more risky. It's always more challenging and the outcome is unknown, and that also makes it more interesting. So I said okay, I'll go to this new area of computer engineering and see what it can be. There were some people at Penn State who had worked in pattern recognition at this time, but I was not one of them until then, so my work was more on basic signal

processing or image processing. So we were the first group of faculty, we were four or five of us who put together a computer engineering program, B.S., M.S. and Ph.D. The university provided many faculty slots, so we were very busy hiring and people who we hired at that time are still there and have contributed much. And then this formed a larger group and this program started around probably 1988, when we started officially offering the degree programs. A few years later in 1991 or 1992, there were substantial issues in the college, in the entire university, in terms of financial currents, due to state funding or whatever reason it was. In the College of Science where the computer science department was present, somehow they did not get along with their dean. And then the dean actually decided to cut the entire department of computer science from his college. And so automatically, we and computer science from the college of science merged to form this computer science and engineering department. So that's how the computer science and engineering department got formed around 1992 at Penn State. Since then it has grown tremendously; it's one of the top computer science departments today and it's very nice to have been a part of such a growth, and contribute to it what I could. And during that time also I had started going to Computer Society Vision conferences, being very active in their programs and then I started moving more towards computer vision; in fact, when I went to Penn State itself, my first NSF grant, I wanted to do something other than image restoration. And so I just looked around at what could be a topic. I was always interested in maps and I said can we teach computers to read maps? So in this sense, literally read maps, you know in the sense take a picture of it and give it to the computer, and the computer would internalize what a line represents, what symbols represent, and then make inferences based on that, to say that this symbol is a city, this is a road, and so I can go from here to there following this path. That would be the output. So that's; if you think back a bit, you know I didn't really look at it that way but it's kind of basically an AI problem, computer vision problem. And so then that's how I got into computer vision, so in the sense of analyzing maps, which led to document analysis. I spent the next 20 years working in document analysis.

Yost: In addition to receiving funding from the NSF, you also did projects for NASA and DARPA. Can you talk about that research?

Kasturi: Yes. So the NSF grant, or the NSF Research Initiation Grant for New Faculty, which is now called the Career Grant for New Faculty; so that was a very good start. But then Penn State was expanding its computing facilities again, as I mentioned about that new dean who was really investing a lot in computing hardware for the entire college, as well as the computing program in the college. And then we had an alumni of Penn State (William Johnson) who was a vice president at Digital Equipment Corporation and he wanted to help Penn State and wanted to provide computers. But then he wouldn't just donate it but the next thing he said was you do some research for DEC. We went and visited them and explored areas of research that they were interested in. Apparently they told our dean that they're interested in document analysis, in the sense that you have a given document like a table, or a technical article, or anything they want to be able separate text from graphics in that. So that way anything that is in there can be read by an OCR system and then the graphics can be preserved as a picture, because there's nothing to recognize graphical elements. So then our dean said okay, here's a person who does something to do with maps, analyze maps, maybe he can analyze your documents. And so we went there [and] it was an interesting experience. They sent a private plane for us to ride to their headquarters in New Hampshire. We made a presentation and then for many, many years they funded us from Digital Equipment Corporation in the form of equipment. It used to be very popular equipment, as you know, the VAX VMS machines. So it was they provided the VAX 780s for our college, several of them; we got one for our own research lab and that was the main thing. Me and my students, our college would pay for it with assistantship to students to do research, and it worked out very well. That led to lots of students working in that area and many papers resulting from that. Also, I got involved in document analysis so that was kind of unique and back then not too many people had done. In fact, one of my master's students (Lloyd Fletcher) who worked on separating text from graphics that gets cited even today. And that has the highest citation of all my papers [laughs], separation of text from graphics, which was published in *IEEE Transactions on Pattern Analysis and Machine Intelligence*, which is again the top journal in the Computer Society — in fact, it's the top journal in all of IEEE today — it got published in that and it still gets cited often. So we continued working on

that, and then we worked on table form separation; automatically it can read the tables and then extract information. People are interested in all kind of documents, can you automatically capture information from archival documents? Those kinds of things. There are a number of offshoots of that.

Yost: And for NASA, you worked on aircraft collision avoidance?

Kasturi: That's right. This came about because one of the summers they had this program, as most of the DoD agencies, as well as NASA, have this summer faculty research program. So one summer I decided to try that, so I got an offer from the Navy for a summer program and then one from NASA. I accepted the NASA one at NASA Langley, at their center. So there, at that time, their program was [pause]

Yost: When roughly was this?

Kasturi: It was 1990, summer. Before that, I had also spent one year, 1989-90, on sabbatical at [University of] Michigan with Professor Ramesh Jain and when we put together a compilation of computer vision tutorial texts, which was also published by the IEEE Computer Society. This NASA program, when I went there, they were experiencing one particular problem that many aircraft, especially smaller aircraft, when they're coming to land in some remote runway strips, they run into some animals on the runway and they cannot land, and have to fly back again. Sometimes it becomes a close call when they see an animal on the runway. I remember one NASA manager saying that I don't care what is in there, whether it's some other aircraft or it's a cow, I want to know that there is something there. So that was collision avoidance; this is technically called a runway incursion problem. They were solving those problems, and I think even today they are solving those problems using radar, mostly, or visually watching what's going on. But he was interested to see whether computer vision methods could work on that. Particularly, they wanted it to work when there is fog because when there's fog, obviously, even the humans cannot see. So they were developing some sensors which operated in passive millimeter wave band, very low frequency, and the problem with that

was that the resolution was extremely poor. So we said okay, in these images can you find anything? Can you find is there an obstacle to the flight? We started working on that — that was just a start — but then it resulted in almost 10 years of funding on different aspects of the same problem. At the same time, you may remember, the U.S. was designing this high speed civil transport, something very similar to a Concorde but it would carry a lot more people, and much bigger, and all that. And then Congress finally shelved it in the middle of the project. This was exactly around that time, and it was a challenging design problem. In the Concorde aircraft, the entire cockpit kind of swivels down. You may have seen when Concorde is sitting, the entire cockpit, swivels down making it look like a bird. The reason is for the pilots to be able to see the ground when they're landing. That's the only reason. But for it to fly at supersonic speed it cannot have that orientation, it must be all aerodynamically in a straight line and so they correct it back, which means it takes — I don't remember how much — some hundreds of pounds of extra weight it seems, to house those gears and other things to rotate the whole thing. And so NASA Ames Research Center was looking at ways to put cameras in the cockpit, under the belly of the aircraft, and then project the images on screen for the pilots to see, as though they are seeing the ground. And they said since we had these images, which are going to be there in the cockpit, can you automatically find any obstacles in that? And so this was a synthetic view of the pilots, they're not really looking at the ground but they are captured from the cameras, creating this view for them, and on that whether we can superimpose any graphics to mark obstacles. And so that work was very fascinating and resulted in a number of publications and theses, and we even did a flight test on one of the NASA aircraft. We designed and we built even the hardware which was to run in real time; so we actually ended up flying in one of their test aircraft. So as you can see, lots of surprising turns, depending on what the customer wants. [Laughs.] I was always interested in application oriented research. Pretty much everything I do I need to see what good it is for.

Yost: You have a long list of students that have got master's and doctorates under you. Can you talk about graduate education and your philosophy and technique with graduate education?

Kasturi: Right. So in fact I used to joke around about how many students I want to advise at M.S. and, Ph.D. levels and I would say I need 52. Someone would ask me why 52? I would say you know after I retire I can only spend one week in each of the students' homes so that I was gone before they ask me to [laughing]; now I'm almost there at that magic number! I always loved working with students, even when as I said, even when I was very young. I always liked to teach my own friends and then they would come to me when they had anything they didn't understand and I would spend hours working with them. Both with my classmates and those in different classes; even when I was in engineering, I had made presentations about teaching about a subject. I went for one year, to National College [for my pre university year], where they used to encourage students to be able to speak publicly; and not just speak as a debater but more as speaker on a technical subject. They used to run this contest every year for students [and] I would even take part in speaking at those things. So I was always interested in teaching. Working with students is probably the most rewarding experience for us as faculty members because we just discuss what's the problem and perhaps give them some ideas, but they're the ones who end up doing things. At times, I used to have 15 graduate advisees or so, but of late I don't have that many. I have about four or five now.

Yost: And in 2003, you left Penn State to join the faculty here at South Florida, and a chair. Can you tell me about that decision and the transition?

Kasturi: Yes. It's kind of an interesting decision because I knew that a number of faculty who were here were doing computer vision. So I knew that from a research point of view, this was a great place, I would not experience much of a startup hurdles here in that; and also, since I was coming here as a department chair, and I still had a number of students, their progress would not be delayed in any way because we had other faculty members who can also co-advise students. And finally, it would be a great place to continue in this research area [after my term as department chair]. By that time, I had already worked as a vice president of the Computer Society, so I had some leadership experience. I enjoyed working in those kind of leadership roles, but I had never worked essentially as an

academic leader, chair of a department or anything. And so when this opportunity opened up here, I just decided to see whether this would be a good fit for me and it just worked out very well. Of course, it was a very difficult decision moving from there because we had lived in State College for 20-some years — 22 years — so our kids grew up there, both my son and daughter grew up there, my wife had all her friends there. So it was difficult. Here, we are coming to a new place. But I thought this opportunity was very exciting, and good, and wanted to explore it and so I came here in 2003 as the chair. And, I also got this endowed chair position as the Douglas W. Hood professor, which was again something that was not available at Penn State.

Yost: Judging from how quickly the department has grown, it must have been a strong commitment . . .

Kasturi: Exactly right.

Yost: . . . to the university computer science program.

Kasturi: So before I came here at that time the dean here was Louis Martin-Vega, and again, he was a very forward looking dean. And when he came here he had worked with the Provost to make sure that his vision for what this college was going to be was something he can realize, because the Provost had agreed to enhance this college substantially and he had received a commitment for a number of faculty slots. So when I came here and looked through what they had at that time, then worked with what was the vision of the faculty in this department, and where they wanted to go; I prepared a plan for the future and gave it to the dean. I said you know, from here to there maybe we can go, but then I had identified areas where we did not have any strength at all, for example in distributed systems, or databases, or security. None of those areas we had any presence here. We were primarily very strong in the hardware, computer vision and a few other areas. In fact, the editor in chief of the IEEE Transactions on VLSI [N. Ranganathan] was from here, and so I figured that we were very good in certain things, but not really in the other core areas of computer science. And then the dean liked it very much and he gave

me 10 faculty slots to hire; six tenure track and four as instructors because enrollment was growing, too. And with that we were able to grow to almost twice in size, and that was a substantial thing; and we realized it in four years, growing that much.

Yost: In 1995 you became editor in chief of *IEEE Transactions on Pattern Analysis* and Machine Intelligence. Can you tell me about that journal and more about the history and what your vision was for it in becoming EIC?

Kasturi: Yes. The PAMI ["pammy"] transactions, as it is affectionately called; it was started in 1978 by Professor King-Sun Fu, who was the same person who also started the International Association for Pattern Recognition (IAPR), in which I served as the president also. After him there were other people (Theo Pavlidis, Steve Tanimoto and Anil Jain), who served as the editor in chief of that Transactions. I used to know these people and meet them in conferences, particularly the CVPR or ICPR conferences. ICPR is the International Conference on Pattern Recognition, which is the flagship conference for the IAPR. IAPR is different from IEEE in the sense that in IEEE, individuals are members. In IAPR it is the associations like IEEE, which are members. So the U.S. pattern recognition researchers are represented in IAPR by the PAMI Technical Committee of the Computer Society. So PAMI TC of the IEEE CS is a member with four votes on the board of the IAPR. So like this, there are some 50 countries that are members of that and they do one large conference every two years and then a number of smaller ones; and so ICPR is a big conference. There I used to meet people like Theo and others, who were the editors in chief of PAMI. So I was very familiar with PAMI and as I mentioned earlier, my very significant research paper was published in PAMI, way back in 1988. So because of these things, I was already an associate editor of PAMI from 1991, when Professor Anil Jain was the editor in chief. Then in 1995 there was a search for a new editor in chief. Professor Pavlidis was the search committee chair at that time. I had known him, and he was also very active in IAPR. Even more so that he knew Professor Tse Feng very well, who was our computer engineering program head at Penn State, and so Professor Feng nominated me to be one of the candidates. I was very surprised I got selected as the editor in chief, it was such a high honor. As EIC, I

interacted much with staff; in particular, I learned much from True Seaborn at Los Alamitos office and Violet Doan in Washington, D.C office about the operations of a professional society which helped me in my long volunteer career.

Yost: What was the year or years that you were head of the International Association for Pattern Recognition?

Kasturi: I was active in IAPR from very early on; so I think from 1986 or so I was doing different things; small, small things… being a chair of a technical committee, for example; so there was a technical committee on map and line drawing processing, for example. I renamed it Graphics Recognition and from then onwards, I also served in other capacities, as a second vice president, and first vice president, these are the elected positions. We were elected by the representatives for all nations. Overall, I was very active in the IAPR and ultimately became president of that during 2002-2004. It's a two-year term.

Yost: Can you tell me about what you saw as the greatest priorities and what you sought to accomplish in those two years as president?

Kasturi: President of IAPR? One of the things that we wanted to do was increase the number of countries who are members of this society. And also we wanted to have more participation from all the nations, particularly from students - so we provided some travel grants for them to be able to attend these conferences. What I had also done because of my interest in document analysis, since I served as a chair of the technical committees on graphics recognition, was to cosponsor a brand new conference. This had happened even before I became president, in fact this was one of the things that helped me to become president. Another group, who is interested in text recognition, was the other sponsor. These two technical committees got together and started the international conference on document analysis and recognition (ICDAR), and this is a biennial conference just like IAPR and even today is one of the strongest ones that's going on in this field. So in that

sense, there were a number of things which were ongoing and then we continued these initiatives during my term as president.

Yost: In 2001 you became a member of the Computer Society board of governors. Can you talk about that experience and what were the issues of the day for the board of governors in the early 2000s?

Kasturi: So again, Professor Tse Feng, I owe a lot to him. He passed away recently. When he came to Penn State to lead our group he made me a member of the IEEE CS Distinguished Visitors Program. He was the chair of the DVP program, and so that's where he introduced me to volunteer work at the Computer Society, way back in 1987. He said oh, this is a small thing; there are lots of things you can do in this volunteer work. And sure enough, we are here talking today, 30 years later almost. And then onwards pretty much anything I could do, I at least had some opportunity to contribute in those things. So clearly he was also the one who was instrumental at encouraging me to do more work in the editorships, which eventually led me to the editor in chief. And that particular experience, four years as editor in chief, I used to meet all the other editors in chief of IEEE CS, and then automatically I was a member of the publications board of the Computer Society. One of those people I used to work with was Professor Ben Wah, who became a president in 2001 of the Computer Society. And so Ben, since he and I had worked on the publications work for many years, he asked me if I would be his vice president. So that's how I got on the board of governors. Anybody who was either an elected person or someone who is . . .

Yost: When you became VP of Pubs.

Kasturi: In 2001 as VP of Pubs, you're automatically on the board. I served for three years. Those were very difficult times for Computer Society because as you may have heard, there was substantial turmoil in Computer Society because of historical reasons which had led to substantial friction between the parent organization, IEEE, and the Computer Society. Some of it has to do with personalities, very strong personalities on

both sides, which lead to a big clash, which ended up in our executive director being fired at that time, and that really resulted in a significant and kind of almost I would say a demoralization of the spirits of all the leaders. All of us serving were told that you cannot be doing this, you cannot be doing that, you have to follow this, this, and this. And almost like a top down rule; about that time, in order to get control over the organization, the IEEE senior staff in Piscataway and leaders wanted Computer Society to fall in line, so to speak. It was not taken very well by the Computer Society leaders and many of them just quit being volunteers. Some of them said they'd never do anything for the Computer Society. It was a very rough time. And all of this major friction happened in 2010. I mean 2000, not 2010. And then in 2001, when Ben Wah became president, he had to deal with a lot of these things. I started working with Angela Burgess who was the publisher for CS. Since then we have had many years of close collaboration. In this sense, IEEE situation, didn't affect anything that I was doing in the pub support, but overall it was a major change to the Computer Society we see today; is a slow transformation from that point onwards to today.

Yost: There was also the challenge of the dotcom collapse.

Kasturi: Yes, that also happened around that time.

Yost: Perhaps that led to some decline in membership?

Kasturi: I don't think that the membership itself declined so much at that time, but what really hurt the Computer Society — and it is still hurting and still declining membership — is not so much any of these issues with the parent organization or any personalities, not those things. But what really caused the problem is because people stopped buying print, because everything started becoming available online, right? So digital, digital distribution of the most valuable product of the Society … now there is no reason for you to be a member because I remember the reason I joined the Society is to be able to subscribe to a *Transactions* at probably $20 or something. Many people became a member at that time purely to get the publication; many researchers became [members]

purely for the Society publications. And of course, membership also gives a discount in conferences, but that didn't matter to us personally because it was the universities who paid the registration fee. But this was the main thing, to be able to get these publications. And that impact, people only were not subscribing to those magazines although it was still being sold, but they didn't see a need for the print copy or membership. Today when I try to go and talk to someone to become a member, they ask what benefit do I get from being a member, it's very hard to tell them. Previously it was so easy; hey, you get this journal that you need for your research. You know at that time there was just one copy in the library, when you go there, somebody may have checked it out, so you wanted your own. That's not true anymore, so I think that has impacted us a lot more than anything else; sort of a *disruptive technologies*, and that has not helped the society. So membership declined, subscription to periodicals declined, and now of course even the subscription by companies has declined, and so everything now has to go through the IEL. Before that, there was no IEL, IEEE's Electronic Library, where we are distributing all of IEEE's publications on that platform, which is through the interface IEEE Xplore. The library behind that is IEL. That didn't exist and we were the ones, the Computer Society, to create such a library, an electronic library, first. So the Computer Society created a digital library and that happened during those times, in the early 2000s. The creation of a digital library, CSDL (Computer Society Digital Library) gave us an advantage, now we could sell something and make money. But then soon, of course, everything became available through Xplore. And then, in fact, much of Xplore when IEEE introduced, it was modeled after CSDL, because we already had that experience. It was nice to be a part of all of those things. The Computer Society could bring something to the table, all our experience, and how to do it because we are the computer guys, and then that worked quite well. But that collaboration, in fact, we saw then has continued even today. At one point, I think Computer Society had a membership close to 100,000. Unfortunately now it is probably under 50,000 or something like that.

Yost: In the early years, with the CSDL, did the revenue generated in selling the digital library to academic libraries as well as corporate labs and other subscribers offset the decline in individual subscriptions?

Kasturi: I don't think it ever completely recovered from the 1990s, when the Computer Society always used to have very good surplus from membership income and then all the sales. And of course, you know when you sell, there's a substantial differential in price from individual subscription to institutional subscription. Even for print copy, right? And that's where, from the print copies, you would get a lot of money even at discount price. And the thing is, the print copy, the university; like California system would buy many, many print copies, one for each of their campuses. Might even be multiple departments would subscribe. Now I think we have a single license for the entire UC system. Although it probably brings a lot of money for that one single license, but it's always better to have lots of small ones, which we now don't have at all. So you can see the impact and I think that has continued even today, I believe we are running a deficit and there's a struggle. That has been very difficult times in the late 2000s. In the early 2000s we were okay, we were doing alright, we were still making some money; it had not completely transitioned to the digital one. But by the time I became president, we were in serious deficit.

Yost: Who were the key volunteers to making the CSDL happen and were there primary contributions from the staff as well? Can you discuss that?

Kasturi: I don't remember all those people at that time, but I knew that we had an electronic products committee under publications. Then when Professor Willis King became president, we invested a lot more into these digital products and he had people, his vice presidents especially, so that I think we even created an electronic products and services board within Computer Society. In addition to publications board, as separate board for electronic products. I believe that happened in the early 2000s. And of course, staff; we had a lot of staff who were competent in the field, to build that. And since we were the first one to do that, and a lot was learned during the process, and I'm sure that it contributed also to IEEE's efforts.

Yost: Along with publications, another source of major revenue of course is conferences. In 2006 you became the first vice president for conferences and tutorials. Can you tell me about that experience?

Kasturi: That was a very short one, just one year, but I was always involved in conferences, even much before that. So I was familiar with the conference model, how it operates, how it works. Although the conferences - when you look at the bottom line budget of conferences- was pretty similar to that of periodicals, i.e., the total for all conferences is almost equal in terms of the budget for all periodicals. But the revenue from conferences is usually very small and here is the reason. In conferences, there's a lot of money that comes in but then it also goes out in terms of conference expenses, particularly the charges for the rental charges for facilities where conferences are held, and then travel, plus more importantly, food and beverage, all of those things. So there's a lot of revenue in terms of registration, but there's also a lot of expense; it almost evens out. Then sometimes, conferences as we know are almost all run by volunteers who control everything at that time — which is a good thing — but then, many a time as I have seen, the tendency is that if there is any surplus that is going to be left over, which is what's really going to go to help the Society budget, the tendency is to spend more; make it better and make it better by, you know, increase expenses perhaps for better food and beverages, or have an extra reception, or something. And so it all goes out. I understand that the people who pay the registration fee, and they need to enjoy the event. But the Computer Society cannot really rely upon the conference surplus as income, so when I was vice president I tried to make some rules — which was not at all popular and I think subsequently I think it has been rescinded — is that to require conferences to budget 20 percent as their contribution to the Society. So from the registration fee, if it is $1,000 then $200 should come to the Society. And then the conference organizers and the attendees didn't like those things very much, and so it never went anywhere since it was seen as a tax. But we do charge a conference administration fee. It is to provide a service like registration service, mailing, and many other services that we provide; and we go and monitor the meeting at the hotel and all of those things. So staff led by Anne Marie Kelly were heavily involved in that at that time. Anne Marie's extensive knowledge in this area

has been a great help to the society. But beyond breaking even, we don't generate much surplus… the surplus that we need to pay for large numbers of things that does not generate revenue. Things like, our educational activities that we do, it doesn't generate any revenue because many of the curriculum and the standards that we establish for education, that doesn't generate revenue. There are so many things that the Society does that are all very good things, necessary things for the profession; people understand that, people going to conferences, everyone understands that but still, somehow, there's kind of a missed connection there between us, and volunteers, and the membership at large that the Society needs the money to operate. So as we have seen, a lot of difficulties in the last 15 years or so, starting with this initial difficulty with IEEE. One of my main goals was always to have a nice relationship with IEEE, other societies, and as well as with IEEE's administration, so to speak. Because as I said, look, my own area was in so many things, I just accidently eventually became more focused on computers; but I just as well could have been a signal processing, or a power engineer. So I can see the need and appreciate all of those things. So initially, we had a lot of difficulty. I still remember one time as a member of the IEEE publications board, as the vice president of the publications board for Computer Society, I went to an IEEE publications board meeting to represent it; and then there, as you know, we have staff in Piscataway who are doing publications, *Transactions*, conference proceedings, etcetera; and we had staff in Los Alamitos — fairly sizeable staff in Los Alamitos, probably almost equal as that — and so there was a report, and then that report they talked probably for about half an hour on what all the staff in Piscataway was doing, as a report to the publications board. Then I got up and spent probably 10 minutes, it was not really a formal presentation, but I told everything that we do in Los Alamitos because they didn't know anything about it. They didn't know that we had so much publication activity; they didn't know we produced such good quality *Transactions* and *magazines* for the Society. They were just not aware of it so my job, I thought, was to really inform them about it. When I reached the end of my presentation, which took 10 minutes of their time, the chair of the board at that time was so much, kind of, brought up with the past experience; it had so much colored his thoughts and said "so what?" - That's exactly what he said "so what?" And my response was essentially, you know we are part of IEEE, we are doing all of these things too.

[Laughs.] So we have come a long way. I think now the IEEE, both staff and volunteers, I believe we get along very well, and that's the thing we spent over 10 years to bring about.

Yost: But it took some time to recover from being dismissed and not counted.

Kasturi: Yes, it took a long time and again, it was also, as I said, we also suffered from financial troubles. And everybody has this. We were having a very large operation, as you know, in terms of staff I think we were 127, that's was as many as we had. We probably have under 80 now. These are all very, very difficult decisions; personnel decisions. And during my presidency, half the time was spent in just deciding one thing: are we selling our Washington building or not? [Laughs.] Those were all very difficult things.

Yost: Can you tell me about that situation, that decision?

Kasturi: Again, during the latter part of 2003, we had volunteers, like other board members who very much had grown up in - we are independent - kind of mentality and we were doing very well, too, right? We were setting the prices and we were generating lots of surplus. We were probably $4 or $5 million up in surplus at one point, the Computer Society, and we were doing well. And so rightly so, we all felt that anything that we do would only make us weaker, like trying to make us a part of a big thing. So some were very much opposed to doing anything collaboratively with IEEE, in one sense. But more importantly, they were concerned about the potential that we would lose our identity because; in fact at that time, we wouldn't call ourself the IEEE Computer Society. The words "Computer Society" would come first, and even the letters "IEEE" was much smaller, and it was there barely, to just about to that extent. [Laughs.] If you see some old copies of *Computer* magazine, that's the way it was, and now it is bigger, and the IEEE logo was not even visible. It was that kind of thing and so it was very difficult to convince those people; and they were very concerned where our headquarters would be; that we would lose Washington as our headquarters, and we had over 30

people or so in that staff there. So they were very, very opposed to doing anything with that; and for them, the building there was the symbol of the IEEE Computer Society, it was the building on Mass Avenue, Massachusetts Avenue, near Dupont Circle. That was the symbol of the IEEE Computer Society was what they were saying.

So, our board had to make a difficult decision in order to save the finances; had to reduce our cost; and it turns out that one thing we thought was we tried to reduce the number of staff, both in D.C. as well as in Los Alamitos. But the building that we were in DC required lots of repair and it turned out that it was in such bad shape, which we did not know — it was a very nice building, looking from outside — apparently there were some serious violations of fire code. And this [inspection] was done when my predecessor, Michael Williams was the president and this issue came about. So we were ready to renovate the building and do some things, because of some air conditioner troubles; and then we found out that it is in such; requires so much repair in there and also it's a violation already, we had to move out right away. We didn't have any time, we had to move out right away. So we got an estimate for renovating the building, it came out at I think $9 million or something to that effect. Some big numbers; I may be wrong with the number but it was big; it was not viable. And so at that time, it turns out IEEE-USA was also in trouble financially. And so our parents said okay, we'll take care of both of you if you both co-locate in the same building. [Laughs.] So they just made both of us stay together in a rental place, and then some money was spent to renovate that rental place, and I think that's fairly evident today. The idea was that by co-locating with actually IEEE-USA, we had to be there in D.C., it couldn't be in Piscataway. The hope was that we would get along even better with IEEE staff-wise, and volunteer-wise. Even that very concept was not liked very much by our leaders from the past, who very much felt that we should be independent, we should renovate, we should spend the money, whatever it cost, the D.C. building, because that is a symbol, because once you sell it you would never get it back. There was pride in all those things but still, we couldn't afford it. That was the issue. If it was five years before that, we had enough money and enough clout to do it. That was the most stressful period; and I spent enormous time talking with every board member personally because I didn't want to take a motion to the board and get

rejected because we felt there was no other way. And the staff was also much stressed. Some people said if this is goes the other way, I'm out. I'm not going to work for Computer Society anymore because this is not manageable. So we didn't want to lose people, or didn't want to lose our initiatives that we were going to do, and just be for this one little issue of saving the building, we had to do all of this. So finally, it all worked out and then people who were there at that time who have now become leaders, they still remember those days, they still remember the stress they went through. It was very difficult but I am glad it is all behind us.

Yost: Obviously very time consuming and challenging.

Kasturi: Very time consuming. It is not an exaggeration to say that I spent more time speaking with Angela Burgess than any other person during that year, period! I was lucky in a sense that my dean here had given me an entire year off during my year of presidency; I didn't teach any large course for that entire year. He said that this is an important thing you are doing and USF is very much proud that one of ours is a president, and so you take all the time you want. And so I spent all the time and then some, on the Computer Society presidency. And I think ultimately it paid off, and I think the people in this Washington office are happy. And there was a lot of discussion at our board meeting that we should always have the headquarters in Washington, D.C. For a person in another country, you say you have an office in Washington, they feel that we are big because that's the capital of the country. So although we don't own the office in DC, although we employ 10 people there now or less, even the executive director doesn't sit there, and all these doesn't matter but we still have the headquarters office in D.C. Anyway I don't know how much it really matters but this is what some of the strong proponents felt at that time.

Yost: And CRA is there, and there's….

Kasturi: Right, but again, we talked really little with CRA. We are there. People in favor of D.C. always said that, yes, they are there, there will be opportunity. They said

government is there, that will be opportunity. But neither the government, nor CRA, or we the Computer Society; we don't talk with them that much - we go somewhere else for our meetings.

Yost: And the sponsored research agencies?

Kasturi: I mean, as volunteers we go.

Yost: Panelists and so forth?

Kasturi: Right. We have work that we do for our university; so we go and take advantage of that, but not otherwise. So, people understood, I think, the board members ultimately; but it was just a handful of people who had opposed — less than that, probably — two or three who were very vocal, very strong, in their opposition to change in our operations in DC and that was difficult.

Yost: Were there things that you envisioned that you wanted to do as president but because of the time-consuming challenges, you weren't able to get to?

Kasturi: No, I think we got lots of other things done; but these are things we still remember because those were the more difficult things to do. Even before I became president, a few years before that we had started this that the Computer Society needs to go through a transformation to go from this print and sell model, to this new digital model and then all the opportunities that it provides. We can communicate more from our new website, and these were the times when you built a new website, you built a new platform to communicate all of those things because as you know, in the late 1990s, websites were just there for you to go and read, not to interact. Compare that to today, it is so much different. All the early work for all of that was done in the early 2000s. Much thought and effort went into that. You might have had a chance to see my report at the end of the year. For the end of the year report, I described a number of new things that we began that particular year. This was a continuation, see, myself; and my predecessor

Mike Williams; and then the one who came next, Kathy Land; we worked like an absolutely unified team. I have much to thank them; we had no differences, and so this so-called 3P model — president elect, president, and past president — this model worked exceedingly well during our time. And so that gave strength to us, to go and represent us as volunteers, and also gave a direction, same direction at least for three years, that way it would continue. If that had not happened, it would have been very difficult for the Society to recover and during those years, it worked very well for us. We had what was called a transformation committee or something like that, which I had chaired much before I became president, and then we had lined up what was the ways in which we needed to go. One was cutting the expenses, and there's only so much that you can do; and then we realized the other thing is we had to grow other income, so we needed to innovate newer products. And so we did many of those things, too. So out of those things, in a summary is that at that time 1) we spent a lot of money on development of certification. During my year of presidency was the time when we actually launched with much fanfare the CSDA, so this is the certification for software engineers at the associate level; and then we already had a next level higher, Level One CSDP already was present. I understand that it was really just not financially viable and the Society has withdrawn from that recently. But we spent a lot of money based upon what was call SWEBOK, Software Engineering Body of Knowledge, and much of it was spent on that because we believed that until that point, our membership was primarily academic people and so we said that three times that many are in industry. So a way that we can grow membership, as well as other revenues, is to create products that sell to the professionals, not just academics. So we started designing products for them then, and when we spoke with a number of industry leaders, their suggestion was some kind of a certification. They said that students come out from schools and they all have degrees in computer science, but that's not software engineering, right? So they can write code, but write code in a systematic manner and do it in groups, they say they have absolutely no concept of doing that, and this software engineering is something you need to teach them. So that's why this body of knowledge was important, how to do all of these things in a systematic manner. And also we created this certification so that people can demonstrate that they have body and they understand that, and how to be good software engineers. They said

okay, if that happens, then we'll be able to make a better decision in hiring on who is qualified to hire. And so we had very high hopes. We spent a lot of time in India, and China, and elsewhere to really sell this product and because that's where the growth was around that time. And so they all felt that it's a good product, but when we suggested to them or expected them to adopt it as a requirement, or asked them to encourage their people to take a look, go and get this certificate because if you get this certificate, perhaps we know that you are really good and we can perhaps give you some incentive, whatever it is. For employees when they are working at a company already, they don't have a job problem there, and they don't want to go take another exam; they don't have time to spend extra time at this. But we had meetings with CEOs of top companies in India and they were all supportive of this concept, but they were afraid of making it a requirement in their job hiring because they said we can't find enough people already, we don't want to make it even harder to hire people by requiring your certificate. Your certificate is good but it's hard to pass and so that way, now if we are putting more barriers and we may lose all these people to our competition, and we don't want to do that. I think that's probably one reason it didn't succeed. And even in the U.S., we were trying to see whether the U.S. government would perhaps say you need to get this certificate in order to be this and get some promotion or whatever. But as you know, it's very difficult to require anything which is only made by one professional organization, so we didn't make much progress in that. Ultimately, we just didn't have enough people taking it.

Yost: In the U.S., as well as India, do you have a sense that the certificate influenced education?

Kasturi: I'm not sure if it really influenced that much. We hired a number of companies who were qualified to offer education, particularly; it was like finishing schools; like the colleges in Europe, finishing schools. You go to a school to get your degrees, then before you can get a particular job, you have to go to these finishing schools to learn what you need to do in a real company. So we were hoping that there would be many of these takers, who would come; after getting their B.S. in computer science, would go to these schools to really get trained as software engineers. That's when they would take our

Body of Knowledge education. But the thing is, because of so much of boom in the software industry, the manpower is not there. Even today, they say there's not enough people graduating, although there's so many schools! When I go to India, you know on every corner there is a computing school. But they say there's still not enough, they'll take anybody with basic knowledge, spend two years on them in-house training them, as opposed to wanting them to get trained outside. [Laughs.] So that is what happens pretty much in every large company in India, - they have their own training program, very intense training program for at least six months, often longer. So we didn't really benefit from that, ultimately. I think it was recently discontinued.

Yost: During your presidency, did you see collaboration, cooperation with the ACM as important? Can you tell me what was coming?

Kasturi: We always wanted to work with them, and one area we do work with them quite well, is with CRA, Computing Resources Association, where we have two members on their board. I voluntarily put myself on that board because I wanted to do that. For those positions it has to be academics, mostly, to be effective there. So I spent four years on CRA Board, and the ACM is very influential in CRA and ACM works very well with leadership there. The main focus of CRA, as a U.S.-centric organization, is to make sure that for one part, the computing research gets sufficient attention from the U.S. government, and funding. The other is to make sure that we have the proper pipeline of students and professionals coming into the computing discipline. So those are roughly the two main areas that CRA focuses on. Funding, and maintaining a pipeline of, particularly, research oriented students; and also enhancing the participation of women and minorities in that. So with that focus in terms of kind of working with the government and trying to influence the government to see the need for funding computing oriented research, computing networks, all of those things. And the other half is in terms of manpower. So the ACM has been much heavily involved with them and we were just barely present and not doing much. During my time and later we tried to really provide a little more interest in that, and focus. And now I think our president elect, and the first vice president elect — Jean Luc Gaudiot and David Ebert — both of them are the

members on CRA Board representing Society, so I think this coming year, Computer Society will be strongly represented in CRA, and that is the best place where to work together with ACM. Other than that, the other place where we work very well is through the SC conference. They don't call it Supercomputing anymore, it's basically the high performance computing conference, but they still use the symbol SC. And that is 50/50 between the ACM and Computer Society. There, a couple of prizes that are given there by either the Computer Society, or jointly with ACM. And it's always the CS president who goes to those things to give out the awards. I went to those three times. But again, you know we don't have much difficulty working with the ACM. It has all been; in conferences, volunteers just work and make it happen. Many of us, as individuals, are often are members of both ACM and IEEE. As leadership within the organization, we haven't felt a need to do anything different.

Yost: Among your many honors, you're a Fellow of the IEEE, and a Fellow of the IAPR, and then in 2015 you won the Merwin Award, the highest honor for service to the Computer Society. Talk about these major awards and what they meant to you.

Kasturi: Oh, I just look at it as something you know, what I just normally would do by myself and it is really kind of those who recognize me for those things because I haven't done anything that other people have not done. But it's just that with the help of all other volunteers, and extraordinary staff support, together, we have accomplished each and every one of these things. And similarly, in terms of the fellow honors, it is mostly based on the research work. There again, it is mostly the work of my students. I am just there just as their mentor, but ultimately, it is the research and the quality of work that they do that results in these recognitions. So I'm honored to be the recipient of these things, but I want to really acknowledge the source of all of those things.

Yost: What do you see as the greatest opportunities, and what do you see as the greatest challenges for the Computer Society, moving forward?

Kasturi: Wow, that's a difficult one in a sense because I've not been very intimately involved with the Society in recent years, and consequently, I'm not sure what are the current challenge facing the Society. I'm not sure exactly whether it is financial or whether it is technological challenges that the society is facing. But overall, I think the Society has a very high reputation for a long time; more so all around the world than perhaps the U.S. Once you step outside the U.S., you say you are from IEEE Computer Society, I'm a president from IEEE Computer Society, anything like that, you get immediate recognition and you get a lot of respect. It happens because of the recognition of the quality of products that we produce. And as long as we keep doing that, I think that we are in good shape. These transient difficulties in terms of finances and other things, and distribution within IEEE, those are in-house matters. There's still the same pot of money within IEEE, of course; it's all something we need to spend a lot of time on, as volunteers, but our members, it doesn't affect them. It's our responsibility to make sure that our leaders are doing that very well so I see this continuing the same way. IEEECS will continue to be highly respected and desired organization, and particularly the seal of quality, because everyone would want to publish or be associated with IEEE CS because of seal of quality that it brings. Talking about this, I want to mention that I had a wonderful year as president, we accomplished so many things. And then on December 25 of 2008, when I was still president, I get an e-mail from a colleague that I don't remember now; which said that we have found that in one of the conferences that is sponsored by the Computer Society, a computer generated paper was accepted; a fake paper. Somebody had written software to write a paper, which used good grammar, right? Grammatically correct, and it used all important key words, so to speak, related to computing; and it had all the format of a good paper, like the abstract and this and that; and illustrations; everything looked like a good paper, but it was a dummy paper and it was accepted. Not only was it accepted but the fake authors of that paper were invited to join the program committee! [Laughs.] And with a very nice letter going to them, you know, "because of your reputation," etcetera, etcetera, "we invite you to be a member of the program committee." I said, okay, I thought I was done; why couldn't you wait four or five more days? [Laughing.]

Yost: So you had the misfortune of that falling into your lap.

Kasturi: It still was on ***my*** calendar.

Yost: That's funny.

Kasturi: I'm not sorry to end it that way. But again, you know, I realized why it happened, and once we understood why such could have happened; and we took a lot of corrective actions. Things have been fixed; very quickly fixed. But still I thought it was an interesting end to a year.

Yost: Yes, I think so. Before we conclude, are there topics I haven't brought up that you'd like to discuss?

Kasturi: Nothing in particular, but then again, I forgot another important thing that we were able to do to get the industry involved more - we formulated a very high position, leadership group from companies. Very, very senior executives — almost CTO level executives from top companies in computing — we formed an advisory board for the Computer Society. Just like we have advisory boards for our publications who are mostly from academia, we wanted to have something of that quality to help us from the industry point of view what the Computer Society should be doing. And that group is continuing, even now and that group at that time was; this whole concept, as well as the formulation and all of that, was led by Professor Carl Chang. He was the editor in chief of *Computer* magazine at that time, but also he had served as president before. So that happened again during my year as president, and I'm very pleased to see that one continue.

Much of what I was doing I learned on the job, and I'm really thankful to all the presidents who came before me and those who came since who have given me an opportunity to contribute; and that has really enriched my life, because in terms of the number of friends that I have, number of contacts, and knowledge that I acquired both technically and in terms of leadership, it's amazing what a free gift I got from the

Computer Society, of being able to have so many friends, and just learning all of these things. I was never formally trained in leadership, but then I really enjoyed being one, and that has helped me in my profession in many ways. And that was also the year — I think I have not mentioned — that coincided; when I'd organize our largest conference of IAPR, the one that I mentioned, the International Conference on Pattern Recognition; you see that poster up here on my wall; here in Tampa the same year, and I was the general cochair in charge of that. [Laughs.] And so it attracted over 1100, and so logistically organizing this with my colleagues, Dmitry Goldgof and Sudeep Sarkar, was a big challenge. But all in all, you know, my volunteer service to IEEE CS gave me an opportunity to know our members very well and get a pulse of them; in terms of what they like, what they see, what they support, and so on. In conclusion, there's an interesting little story here I want to share; the year I was president, you know sometime in April the nominations come to you, it's the list of candidates that are going to be on the ballot for next year for president, first vice president, second vice president, and seven members of the board. These are the people we elect every year. So I got that list; for each position there were two people or more competing. So that came in — this was in April — and then I looked at those running and just jotted down on a piece of paper who I predicted was going to win, gave it to Angela, and told her just save it and let's just see what happens. And I was extremely pleasantly surprised that every one of those position predictions came true. [Laughs.] So I felt kind of good about that, as at least maybe working for so many years as a volunteer at least I knew the trend and preferences of the Society membership.

Yost: Thank you so much for taking the time and sharing your insights.

Kasturi: You're welcome. Thank you very much for really traveling this far from Minnesota to come here. I appreciate that and this is a great service you are doing.

Yost: Thanks.

Kasturi: It also brought back many pleasant memories for me of all those years, even in just thinking about what is it I'm going to say today. It was nice, thank you.