An Interview with

GERALD L. ENGEL, D.Ed.

Interview #

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Abstract:
In this interview Gerald L. Engel describes his education, his involvement with the IEEE Computer Society, and his term as President of the Computer Society. He also describes his role in the genesis and development of the Computer Sciences Accreditation Board, as well as his leadership roles with the IEEE Society for Social Implications of Technology and the IEEE Ethics Committee.

Russell: This is Andy Russell, I'm here with Jerry Engel at Stanford as part of the IEEE Computer Society History Committee's project to interview past presidents. We'll talk about three things in general: first, how you became interested and involved in computing; second, your involvement with the IEEE as president if the IEEE Computer Society and other capacities; and third, your role in the Computer Sciences Accreditation Board. I'd like to start by asking you: how did you get interested in computers, and what was your education like?

Engel: Well I had a bachelor's in mathematics; and a master's in mathematics, also, from LSU. And then I fell into the usual trap that I went to work for the Navy for a while and they moved me over to computing, and I found out I was actually pretty interested in computing and sort of slipped over that way, at that point.

Russell: Where did you earn your bachelor's degree?

Engel: Bachelor's at Hampden-Sydney College, which may be one you never heard of. [Laughs.] It's a small, all-men's school, and *still* an all-men's school in Virginia. And LSU for master's; and then I got the doctorate from Penn State.

Russell: What was your doctorate, and when did you complete it?

Engel: Doctor of Education, 1974.

Russell: And then you stayed involved with computing at the time?

Engel: Yes, I went to Virginia and was working at the Virginia Institute of Marine Science as their director of computing.

Russell: What sort of work did you do in that capacity?

Engel: It was database stuff. That was back in the days when memory was the most expensive thing you could get so we were always trying to see how can you get more memory into things so you can process these big data files; it was also the time of the work offshore area of the East coast, and huge amounts of data were being gathered.

Russell: So there were logistical problems.

Engel: Oh, absolutely.

Russell: Then at what point did you get involved with the IEEE and the Computer Society?

Engel: IEEE is; actually, it was an even stranger one. I joined ACM in 1968, when I started to be looking at interesting things about problems in computing. And I was involved with them for about to the late 1970s, early 1980s kind of thing. We just hit one point where I wasn't terribly happy with the ACM leadership, at that point, and I had been working with a few of the folks within the Computer Society that were involved with both the curriculum projects that we were involved in, and the gradation stuff. And so I said I had enough of that, so hey, I'll just go over and do stuff with the Computer Society, and basically, I enjoyed it, and I've stayed with it, pretty much.

Russell: Before moving on to that, was your involvement with ACM; did you hold any officer positions, or what was the extent of your involvement?

Engel: I was trying to think of that. I was in charge of the curriculum committee for ACM, at one point; and I know I ran for secretary, I think, but I didn't win. And that's about it; that's about what I could think of that I was in. But I was basically working with the curriculum committees.

Russell: Their big report was the Curriculum 1968 Report?

Engel: 1968 was a big curriculum; it was one of the things that actually got me interested in what ACM was doing. A fellow at Maryland and I worked on doing the version for smaller schools of it, that came out about 1976. And then he and I — Dick Austin — we got going to join ACM and Computer Society; no, that's not quite right. ACM came out with the 1978 curriculum that he and I had worked on. And then we worked with the similar group within the Computer Society at that point, and we had two different reports, but we had them so that they were in fact complimentary to each other. One was more for the non-engineering schools, one for the engineering schools, and things of that sort.

Russell: Was the name of the field something that was up in the air at the time, as well as curriculum? Or did it not matter to your curriculum committee what different departments called their degrees?

Engel: I don't think it bothered us much. I think it was clear that you had different pushes from them that by and large, the computer science programs came out of math programs, and stuff of that sort. They got the stuff that was coming out of the Computer Society was, for the most part, coming out of the stuff from electrical engineering. But there was an awful lot of overlap. If anything, we concluded there probably should be more.

Russell: So that experience led you to get involved with the Computer Society?

Engel: Yes. As I said, I was down on the administration, at that point, of ACM and I said well, why do I want to do this if it's not fun? The people in the Computer Society had more fun there, so I just kept working with them. And that's about it.

Russell: Was there a determined path, or predetermined path that one goes from being a member to becoming president of the Computer Society? How did that evolve?

Engel: I'm not entirely certain. I know that somewhere in the 1980s I was appointed as the Vice President for Education, I think. I'm not going to even try to come back with

who actually made the appointment but I did get into that position and from then on, I had done just sort of odd things as they came along. So I thought I could do it pretty well, and so forth, so I was, I think, Vice President for Conferences, at one point; and I said Education; and, I think, even some other oddball jobs that had come along.

Russell: What was involved in those vice president positions?

Engel: Basically, just to run that portion of the operations. For education, we were worried about what are you going to do in terms of accreditation? What are we going to do in terms of curriculum? And so on. With the things in conferences, and so forth: what do we have to do to make them effective and run well?

Russell: So once you were elected president, you then served a year as President Elect, correct?

Engel: Correct.

Russell: And then you get one year as president, and so this gave you time, presumably, to formulate some plans or strategy for what you might do for that term?

Engel: Yes. Also, you end up having a year as Past President, too, and all of those actually do have an important position, in terms of how things go along. I was there at a very difficult time because the executive director had been how I best phrase it "relieved of his duties" by IEEE, not the year before me, but just about the year before me. And they brought in someone, which they actually had to do at the time of the attack in New York — literally — on the day of the attack on New York and on the Pentagon, and they were meeting down in Pentagon City.

Russell: What a way to start.

Engel: Yes, it was kind of strange. So we had a new executive director and it presented some problems. It was not a situation that we could just get rid of somebody. It was a case where we had to have some politics carefully done in order to make sure that happened over the right period of time and the right future of the society went ahead. So that turned out to be probably the biggest part of my run there.

Russell: I assume you stayed involved with conferences and publications, and oversaw the different divisions there. Do you remember any significant initiatives or changes in either publications or conferences, or technical committees during your time?

Engel: That was back in the times that we were doing very, very well with the supercomputing conferences, and they continued to do pretty well. Publications, I don't think we made any major changes at that point. Education, again, we were primarily looking at the long term; you know, how is the long term future of this society going to go ahead with the current leadership and how do we best do it in the best possible way, in order to come out of this?

Russell: There was a strategic plan, is that right? In 2004?

Engel: There was, and I think it did not have much impact.

Russell: I see. So it wasn't one of these formative moments?

Engel: No. I think, again, what you were looking at was this is something that had been primarily prepared by the previous staff administration, and that was not going to be successful.

Russell: In one of your Presentations at the Board of Governors, you used the term "market-oriented" several times. I want to ask you about that and if you remember what was the context for that was?

Engel: Probably trying to forget it. [Laughs.] One of the things that a lot of folks have is a feeling of a difference between the Computer Society and the ACM. ACM tends to be seen as typical academics. And within the Computer Society, there is both a stronger membership in terms of the percentages that are coming out of industry, and I think that was the main thing that we were after is, you know, is there a good way in which we can take advantage of that and work with that so we have a better operation? Did we succeed? Again, I doubt it. Again, for a number of reasons. Now, my successor, who was carefully planned to be a) a female; b) a black female; and let's see, somebody who was very much in that community, she was doing tremendous things. And part of my job was to get that person into that position to make some change; I couldn't actually sit there and say well, I represent the computer industry. I'd been way too long in academia.

Russell: In some of your speeches or reports, and also from that year, you mentioned relationships with other technical societies, particularly in the Washington, D.C. area. So I presume that you wanted to build relationships with ACM, but your comments make me think that there's a little bit more to your thinking than just working with ACM.

Engel: Well, it'd be nice to figure out how we could've gotten into them, and it was not a good time to deal with those organizations because they were changing a lot at that point, and we were too. An awful lot of the defense groups have their headquarters in Washington and that would seem to be a group we want to pay more attention. Computer Society, in the history — at least up to my time — hadn't had significant interaction with the NSF, compared to ACM. I think there was some desire to try to accomplish that and again, I don't know that we were really successful in doing it.

Russell: One obvious target would be NSF, but I can imagine that the Computer Society's expertise would be welcome in the executive branch or in Congress. I believe there is a program for IEEE Congressional Fellows, for example.

Engel: Yes, that program was handled by IEEE U.S.A. And IEEE U.S.A. and the Computer Society never had particularly good relations. Why? I think the Computer

Society just couldn't quite understand why it is that we had to be in a supporting role; and it's not an option to join the IEEE U.S.A., you have to do that. On the other hand, if you look at the membership of the IEEE U.S.A., the membership is very much the classic electrical engineering groups, and not the computing groups. So it's never worked out real well. Working together, yeah, good idea, and to some extent hopefully with the licensing stuff, that will begin to show up and will begin to make some sense. But there's always been some stress between the Computer Society and the electrical engineering community.

Russell: That was another theme that jumped out at me from your remarks is that you appear to spend a lot of time and energy working on that relationship with IEEE, between the Computer Society and IEEE.

Engel: That's fair. [Laughs.]

Russell: You mentioned the topic of licensing, within the context of IEEE U.S.A. Can you say more about that?

Engel: There's been an awful lot of questions about coming up with schemes to ensure the value of computer people and one of the questions is, do we want to license them? Now the way that that seems to be going and has currently been approved is that we'll do that in terms of software engineering, and in particular where it affects health and safety of people. And that will require, similar to you have to have a licensed engineer who can certify the bridge is going to stay up there; that the plane will to stay up there; or that the medical device will work and work correctly; etcetera. Now, the real question to me is does that also apply to financial industry? It's the health and safety of that industry, probably more so than planes and other stuff, that we have to worry about. This has been a touchy point between ACM and the Computer Society also. ACM started off on the project and then they sort of dropped out of it because they thought that the time wasn't right. However, the most recent — not the most recent but in the last month or so — president's message of ACM indicated that maybe it is time to be thinking about this

again. The difficulty is the ACM board was almost exclusively academics, and the Computer Society board was well represented by industry. And I think some of why that happened that way and why they broke apart.

Russell: Who would the licensing body be?

Engel: At least at the moment, there are at least 10 states that have agreed that they're going to certify software engineers.

Russell: Through IEEE, or through the licensing bodies in the states?

Engel: Through, what is it? It's the body that does the accreditation. It's not an IEEE thing but IEEE is a player in that. Require, typically, they graduated from an accredited program; passed the first exam; you pass the second exam after five years; and so on. Again, I'm drawing a blank on what the names of those organizations are, but [pause]… Basically, it's a state decision. And there are actually 56 groups that actually license engineers in the United States. Go figure that out. The answer to that is California actually has two of them; one for northern and one for southern California. And the others are in places like Puerto Rico, and Guam, Washington DC, and so on.

Russell: It sounds like a headache to try and get all them on the same page.

Engel: Yes, and in fact, they don't have the same rules even and it becomes very interesting.

Russell: Before I move on to ask you more about CSAB, I just wanted to ask you if there's anything else I might have missed about your tenure as president of the Computer Society or anything along those lines.

Engel: Well, like most other volunteer positions, it's nice to be done. Clearly, I was dealing with very good people and I thoroughly enjoyed it. And I think I helped along,

giving some pushes, so that they'd keep moving after my stay. That's worked out well, and they're reasonably happy with it.

Russell: Was it too much of a challenge to try and balance those duties with your academic responsibilities or your day job, or did you find it easy to manage?

Engel: Short answer, no. Real answer, I found a way. No one actually got in the way of blocking it within the university. They liked it actually; they liked to be able to point that they had the president of the Computer Society here, I think.

Russell: It sounds like that would go a long way.

Engel: And it's about the same time I got to be a fellow and they liked that a lot. I'm also a fellow of the ACM.

Russell: Is this a rare class of people, who are fellows both in ACM and the Computer Society?

Engel: It's getting more usual. It was, at one time, a very strange group but no one else is my department is a fellow of both of them.

Russell: I want to turn, then, to CSAB and ask you more specifically about that and try to build the chronology of accreditation of these different programs. Curriculum 1968, as we've already discussed, looms large; there was an education committee formed in 1970; and then, you mentioned, ACM recommendations in 1978. CSAB was formed in the early 1980s.

Engel: Correct.

Russell: Can you talk me through from 1978 through the formation of CSAB?

Engel: Sure. Well, 1978, we did come up with the ACM curriculum. I went to work with the Computer Society, also, which was looking for the same kind of a thing. They came up with a report on Computer Science and Engineering as a title. I think at that point what we did was we said let's look at how these two things come out and then how different are they? The answer was, pretty little; that they're remarkably the same. And at that point, the conclusion sort of hit us that maybe next time we ought to sit down and do it together. When we came to that conclusion that these were about the same, it made sense to say well let's just come up with an accrediting body that can actually handle something that could deal with both of them.

Russell: And at that point, was there any talk of affiliating it with ABET? Had ABET done anything in this field?

Engel: No. Actually, ABET was very helpful. They thought it was great to see computing become an accredited area, there's no question about that. The original office of ABET was in the Engineering Societies' Building in New York. They provided that and they provided the individual who became the first executive director, and he was one of their employees. So they were very, very helpful in putting all of that together. At the time, we were definitely trying to come up with something that would include the more liberal arts kinds of programs with the engineering programs, and that was where there was some concern, both in being able to sell it to the engineers and also being able to sell it to liberal arts people. And that was the main thing we had to work with and that was where the politics of it became important, and I think we were very successful in trying to pull that off.

Russell: And the process concluded with one set of model curricula and quality standards that all universities would adopt?

Engel: Pretty close. Now on the other hand, it can't be quite exactly the same because there are reasons that have to go with the title "engineering." But then there's other stuff too, and how do you say which are which, and so forth?

Russell: So you had to design some flexibility into these things.

Engel: Yes.

Russell: And so how long did that effort take? You started in 1984, 1983?

Engel: Oh, we started probably in about 1980, talking about it and then working from there up. I think it actually came into effect about, what, about 1984 or 1985, when we started doing the business.

Russell: And then there's also a CSAC?

Engel: CSAC was, again, it was learning from the ABET. The idea was that we would probably have different commissions that would go within the CSAB; so you might have say, business data systems, or something of that sort, as well as computer science, and as well as, you know, pick something else that uses computing. It didn't come to that but it moved fast enough to really have those come into play as separate kinds of things.

Russell: In retrospect, do you wish that there could be more diversity in these different accreditation boards to account for different types of computer programs – including programs and fields that didn't exist in the 1980s?

Engel: I think it's okay. I'm sure there could be arguments both ways but I think it's okay. Efficiency becomes kind of important in most of these things. But, you know, we still have some things; if you want to actually have a program in electrical engineering — actually computer science and engineering — you must be accredited both in computer science and computer engineering in that program.

Russell: I see. With any standards that are issued there's usually resistance from some groups that will be responsible for implementing the standards. In this case, that would

probably mean the computer science departments, who were the subject of site visits or engaging in their own programs of self-study to get accreditation. How significant was that over the years? I assume you did quite a bit in terms of site visits and those sorts of things.

Engel: Yes. Again, I think we grow up with those things, that they happen naturally, and sometimes they don't happen at all. The biggest problem was administrations that would say we don't understand why you think — one of my favorite ones — of bringing a professor of sociology to teach beginning computer class because he wrote a program once. I think those were the biggest complaints we were getting, especially the smaller schools. At the other end, you also hear some of it, if you're a Stanford or a Washington, why should we bother? Again, I think some of that still exists. It was accepted pretty well by the engineering community and I think it's now accepted a lot more by the computing community, too. And that just took time and maturity.

Russell: So some of those departments were some of the first departments; Carnegie Mellon or M.I.T., those sorts of departments; they would've resisted or they would've needed to be convinced.

Engel: Carnegie still is not accredited by CSAB — or ABET — in computing. M.I.T. was immediately and it was much more of the case that well, we think it's important and we gotta support it, even though we know we're better than anybody else. [Laughter.] Carnegie has somewhat of a different attitude, and Stanford has somewhat of a different attitude; and again, it's been up and down.

Russell: Have many of their faculty taken part in either as officers, or presidents, or something in Computer Society, or CSAB, or some ACM?

Engel: Some, but not a lot. That's not where their interests are. Their interests are in just standard research; they let someone else do the administrative stuff for them.

Russell: So they might not necessarily understand what's at stake for them with the accreditation process.

Engel: Yes. And working at accreditation doesn't bring the university money.

Russell: So some schools — hypothetically — could see the need to be accredited in the engineering disciplines but not necessarily in the computer disciplines.

Engel: Engineering schools had a history, a long history of their programs were accredited. Plus, many states require that you graduate from an ABET-accredited program to practice engineering. Not all states, but a lot of them do. So then you can't not have your students graduate from an accredited program or they're not going to go out and work as engineers.

Russell: Right. You said before that over time, you think that more and more schools will undergo accreditation…

Engel: Yes.

Russell: … and it's for this reason?

Engel: It's been pretty steady.

Russell: Are there small schools that struggle with this, probably due to faculty issues and other issues? Have there been any real systematic troubles with those schools or has there been sort of a negotiation or a way to make sure that they can meet all the requirements for accreditation?

Engel: Again, if it's come, it's come from the administrations not from the faculty. I think most of the faculty agree that hey, we've got to have four or five faculty members. You can't have any curriculum that's run by one person.

Russell: I don't think I have much else on CSAB, then, other than to ask you if there are other people who I should talk to about CSAB. I mentioned Ray Miller, before.

Engel: Pat LaMalva, he's the fellow up here in Stamford; he would be an obvious one. Tom Cain, I don't know whether he's retired or not; he was at the University of Pittsburgh. He was certainly one of the early players in putting this all together. He was on the Computer Society end of it.

Russell: You mentioned John Impagliazzo.

Engel: Yes, he was definitely someone I talked to a lot on a whole bunch of stuff. The main thing is that his really primary interest is in computing history. So you really do want to talk to him.

Russell: Okay. That last thing I wanted to ask to you about was your term as president, recently, of the Society for Social Implications of Technology, and your term as ethics chair of IEEE. Those are two different things. Can you say a little bit about each of those experiences?

Engel: Well, SSIT is one of the societies. It's the smallest society versus the Computer Society, which is the largest. I figured if I could do the largest, I ought to be able to do the smallest one, also. Again, it was a society with some serious problems and it needed some radical changes, and I wanted to see that the radical changes got pushed and I think that they are, and I'm feeling pretty good about what I'm seeing happening. I have a strong feeling on that one because the person who I think is going to be the savior of that society is one of my former students that I've been working with. Then there was the ethics committee. I was the first chair of the IEEE Ethics Committee and that was a difficult, difficult thing. There was a strong feeling that we ought to actually have an ethics committee that did something. And, I think, true both of IEEE and ACM, they want to be able to *say* that they're all for ethics, but try to do something and it's another

perspective altogether. So we tried to do several things and basically, we got the committee pretty much tossed out. There are now some others that are in there that are not doing a great deal.

Russell: What year was that?

Engel: That's a really tough one. I think that was about 1979, or about then, to 1993, 1994, that period.

Russell: What sorts of initiatives struck you as important?

Engel: Well, we were looking at ways of, you know, what can we do if somebody hits a problem and they don't understand it totally, and they want to talk to somebody who can explain to them what their options are and what the problems are with how they use those options, and so forth. And the IEEE administration had an awful lot of concerns as to what the legal problems of that were, and how do we do that, and how do we put those two things together, and things of that sort. I got that established as the chair of the committee. My successor killed it. He was very much in favor of it but he thought it should be just much more powerful and IEEE didn't like that, and it sort of went away, at that point. The group is still there but it's very hard to find it.

Russell: This is something that comes up with my colleagues who teach ethics, who say it's one thing to have a code of ethics, and IEEE has had this it's entire existence, as far as I know. But usually, the interesting cases are the cases where it's not really clear what to do and then that's when ethical action and decision making becomes really crucial.

Engel: Yes.

Russell: And so this might've been a way to support either individuals or institutions, presumably, with those sorts of problems but I guess that raises liability and other issues.

Engel: The lawyers seemed to think so or at least, they could find lawyers that thought so.

Russell: Sure.

Engel: And it's sometimes hard to figure that out.

Russell: Yes. Well, it's a missed opportunity, I suppose.

Engel: Yes. IEEE has a lot of lawyers.

[Laughter.]

Russell: Is there anything you want to say about your time as at NSF [Engel was a program director (1991-1993) and acting deputy director (1994-1995) for Computer and Computation Research in the Computer and Information Science and Engineering Directorate of the National Science Foundation] or what you tried to accomplish there?

Engel: Not really. One of the things that we did is we definitely got a lot more programs going for under represented populations. That was a lot of fun and I think we did some wonderful things there. One of the things that I really was pleased that we did was we really did some nice work on getting the native population involved in computing, in ways in which we could do that. That was a lot of fun; lot of good work. Then in the other job, it was much more administrative and it was nice to learn about how to deal with the administrations. I wouldn't go back, but it was a lot of fun to have a chance at it.

Russell: Is there anything else you want to add, or something you thought I might've asked and didn't ask?

Engel: Can't think of it.

Russell: Okay. Can I follow up with you if I find questions as I go forward?

Engel: Absolutely.

Russell: Okay, good. Thank you very much.

Engel: My pleasure.