

AN INTERVIEW WITH DR. YI PAN OF GEORGIA STATE UNIVERSITY

Ubiquity is proud to publish this inspirational interview, which starts with a discussion of the creation of the computer science department at Georgia State University, and concludes with the heroic efforts an impoverished student from Tsinghua University in China overcame many obstacles to rise to a significant position at Georgia. The interviewee is Yi Pan, Chair and Professor of Georgia State University's computer science department, who provided us with these inspirational reflections on computer science, academic success, and *true* success. The interview was conducted by Ubiquity editor-in-chief John Gehl.

UBIQUITY: Let's start by having you tell us about your program at Georgia State University.

PAN: Sure. Georgia State, as you know, is a relatively a young university, and all its PhD programs are really young. The Computer Science department was established only in 1999, when it split from the older, original department, which was called Mathematics and Computer Science department; now we have an entirely independent department focused on computer science. Our PhD program was established in 2000. So, as I say, it's a new department. I joined the department that same year, and so on the same day I started my work the PhD program was established. In fact, before I came here, when I was being interviewed to come here, I was concerned about the PhD program; it did not actually exist yet. However, the proposal was out and I trusted that good things would happen, because Georgia State is a major research university, one of the three public research universities in Georgia, and many other programs in our university had PhD programs already. So I felt the PhD program would be realized in the near future – maybe 2000 or 2001 or 2002. So I joined the department and luckily we got the PhD program that very same year. And then, of course, with the PhD program, we could recruit high-quality students and do more research and less teaching, relatively speaking. So that's the department's story.

UBIQUITY: When did you become chair?

PAN: I became chair of the department in January 2005. From 2000 through 2005 we had produced, I think, only two PhDs, and when I became the chair in 2005 I felt we needed to push the department further; basically, to increase research productivity and increase production of PhDs, and to make it a visible department in the nation, at least in certain research areas.

UBIQUITY: Give us some statistics on the whole program. You now have how many faculty, how many students in the various programs, etc.?

PAN: We have an entirely independent department focused on computer science since 2000. Right now we have 15 research/teaching faculty plus three lecturers. A total about 18 faculty members. We have around 70 PhD students and 60 Master students and a little bit over 300 undergraduate students.

UBIQUITY: Compared to the number of PhD and Masters students you have relatively few undergraduate students.

PAN: Actually, that's true. That's the current trend for the computer science undergraduates' education with the enrollment slightly going down little bit each year, but starting this year the credit hours have increased a little bit. So we don't know the real figure yet but my guess is that the number of undergrad students may be close to 400 because undergraduate enrollment is really dependent on the job market. The PhD/Master level more depends on the research program of our department and also depends on the available level of financial support. In other words, if the job market is really down in computer science, undergraduate enrollment will go down. However, if we have a lot of fund we can offer PhD students for financial support, many students will enroll, especially ones from foreign countries. Consequently, the enrollment

of the PhD program really depends on research agenda. So right now we have 70 PhD students and the PhD production increases rapidly. In 2004 we graduated only two, and then the next year five; the following year, 2006, we had around ten, I think. And then last year was the biggest so far: in 2007 we produced 16 PhD students. That's very big achievement for a department of our size.

UBIQUITY: How does it compare to other institutions in this part of the country, such as the University of Georgia?

PAN: UGA has had a PhD program more than 10 years, I think, and their production is below ours as far as I know. And also, the ranking of our department is already higher than UGA's CS Department now based on PhDs.org, a graduate school guide agency. According to a very fair comparison of all these facts, our own PhD production is increasing, the quality is getting stronger, and our faculty research is really getting much better, along with peer-reviewed publications and research grants. All of our young faculty members have National Science Foundation or National Institutes of Health grants or industry grants, and they're a very productive group of people. And the last two years we hired two National Science Foundation Career awardees – the one we hired two years ago, one year later got the award. Another one, he got the award in another place and we hired him last year. So, we have attracted many outstanding young faculty members. In other words, this department has become quite prominent, at least in certain areas such as bioinformatics. In short, the history of our department is getting better all the time, and we are, of course, hopefully, moving further along the path to becoming one of the most important research departments in the nation.

UBIQUITY: Congratulations on your swift progress.

PAN: Thank you. I also want to emphasize that our department is not big, compared with Georgia Tech, for example, which has maybe close to 100 faculty members. As a result of this size discrepancy, it's very hard to compete with them directly, because, for example, they might publish 1,000 papers, whereas in our small department we cannot publish anyway near that many; Georgia Tech's computer science program might get \$10 million in support and our small department can't hope to reach that level.

UBIQUITY: What did you decide to do about the problem?

PAN: I had discussions with the faculty and other interested observers, and we decided to concentrate on just several areas, one of which is bioinformatics. Now, why bioinformatics? Because I shifted into bioinformatics only around four years ago, when suddenly NIH gave a grant to somebody who has no experience in biology and I happened to be available and willing to transfer. I said, "OK, I'll do it." So we applied for the grant and got it. I was really new to this area yet they were willing to give me money! I said, "OK!"

UBIQUITY: Who was it that gave you the money?

PAN: National Institutes of Health - NIH. They wanted computer scientists to get involved in this new area – bioinformatics.

UBIQUITY: And they specified that it was for somebody with no experience?

PAN: That's right. In other words, it was like supplemental grant. Dr. PC Tai, a biology professor has a major grant – one point something million dollars or so – and the NIH says, "Can you find a partner from computer science and who has no knowledge in biology? If you can, we want to give you additional money to basically introduce this guy to bioinformatics research!" And Dr. Tai found me and I was happy to say OK. That's why I found this field fascinating and exciting, and to me it's really a new area. And the money is available, so it's an especially good area.

UBIQUITY: What did you do then?

- PAN: We formed a bioinformatics computing center at Georgia State. Of course, our department plays a major role together with Biology and Chemistry Departments. Dr. Rob Harrison is the director and he has lot of years of experience in bioinformatics research already. So I suggested to other faculty members: "If you are somehow interested in bioinformatics, you should really try to do something in this area. For example, if you are doing algorithms, you can do algorithms in bioinformatics; you can do something besides fundamental, basic research in algorithms. If you are in database, can you do bioinformatics database instead? And the same with machine learning and artificial intelligence, right?"
- UBIQUITY: Did you convince them all?
- PAN: For the most part. Some might say skeptically, "How can you do AI or machine learning applied to bioinformatics?" Well, what happened is that, right now, many people are doing exactly that in our department – around 10 people are doing something in bioinformatics. Of course, we used seed money to attract faculty to bioinformatics. The seed money is from a NIH center planning grant. And in this way our department has gradually become rather famous because relative to many institutions it is we who are the bigger group, with 10 people just in bioinformatics, you see?
- UBIQUITY: Yes. That's a significant concentration of people.
- PAN: Actually, in the whole nation very few computer science departments can compete with us. For example, at Georgia Tech, you have 80 or 100 faculty members. But if you ask the computer science people there how many of them are really in bioinformatics, the answer will be very few. And if you can ask any state university computer science department how many are in bioinformatics, the answer will be less than 10. And our number is big. So this way, we can really make an impact. Now, why is that? Everybody applied for NSF and NIH grants with biology people to get them more interested. And we're editing journals in bioinformatics, and I'm the editor chief. This way people know, "Oh, Georgia State. Oh, Georgia State bioinformatics journal." And we organize an annual conference at the Georgia State campus and this conference is called the International Symposium of Bioinformatics Research and Application. This way each year people submit a paper and they come to visit our campus see that our faculty are doing a lot of research in this area. The impact and visibility are huge. And I also established a book series in bioinformatics with John Wiley, the publisher. So overall, I hope the impact will be significant because by publishing more papers in bioinformatics and by editing a journal, organizing conferences and editing a book series in this area, all from our department efforts, we will be increasingly noticed and respected. Eventually people will recognize our department as one of the major centers in the United States for doing research in bioinformatics.
- UBIQUITY: Do you think that Georgia State is already among the top 10?
- PAN: Among the top 10 bioinformatics centers based in Computer Science departments, yes, I believe so. Now, if you compare bioinformatics *research* centers, I don't know, compared to Harvard Medical School or the San Diego biology department. However, their bioinformatics research is different from ours, and let me explain why. The answer is that these bioinformatics centers basically are using computer software or computer tools to serve their biological data requirements. Most of the time, they just use an existing tool or Web page to predict or to analyze their data, and they eventually discover new things in biology. Bioinformatics research centers like the Harvard Medical School bioinformatics center are roughly of that nature.
- UBIQUITY: And yours differs how?
- PAN: Our bioinformatics research has more to do with improving computing techniques or methodologies to make them more efficient, more accurate. In other words, our emphasis is not on the biological data, our emphasis is on computing, technological innovation, and improvement – of course, with respect to bioinformatics data and applications. So, in this sense, coming from this angle, I think our department should be one of the top five.

- UBIQUITY: Where are you mostly recruiting your students from at the various levels?
- PAN: The undergrad students mostly from Georgia. The Master level is mixed– sometimes from the local population, but with most of the students coming from China, India, Korea, and other countries. And we have some from Europe, mainly from the former Soviet Union, such as Moldova and other countries also such as from Vietnam. Now, our PhD students are also mainly from foreign countries, but there are America as well. Many Americans are part-time with us. Some of them are already assistant professors in small teaching colleges and hold degrees at the Master's level but want to have a PhD so that they can get a promotion more easily.
- UBIQUITY: Has your personal history and background, as someone who came to the U.S. from China, made it easier to recruit international students?
- PAN: Yes, I think so, and many international students contact me because they see my Web page, they see that I'm from China and they feel I'm successful in research and administration, right? And they are always saying to me, "My background is this, or that, or the other, can I join your department or join your group to be your student?" and so on. I always reply nicely and transfer my email to my assistant Tammy, who with a small package explaining, "To be accepted to our program you need to do this, this, and this" and many students feel the requirements are reasonable. They apply and we accept them. Many of our students from China or India studied at very well-known schools.
- UBIQUITY: So you're quite happy with the level of international interest in your program at Georgia State.
- PAN: Oh, yes! Yes, yes, yes!
- UBIQUITY: Besides bioinformatics, is there any other specialty in the school?
- PAN: Yes, another area that we try to emphasize is networking and distributed computing, because we have a half dozen or so faculty working in this area. Again, we try to concentrate on specific areas so that we can make an impact, right? So, for example, last month, actually, I attended a committee meeting for a conference called ICDCS – International Conference of Distributed Computing Systems. ICDCS is a major conference, and acceptance rate is only around 15 percent. This year the conference received over 600 papers, and only about 100 papers were accepted, so you can see that it's very, very competitive. Yet our department has had two papers accepted in this conference, in our very first time publishing papers there. And we've also had conference papers read at Infocom, Globecom, ICC, a number of other major conferences in networking and distributed computing. And I feel very happy, because in the past we weren't ready to do that. Now, gradually, we are doing better research and we can publish in major conferences and major journals. And that's why, in Chicago during the committee meeting, one professor from Hong Kong said to me, "Hey, Yi. We really see your department moving up so *quickly*! Before we didn't see many papers in this area from your department, and now suddenly we see major conferences publishing papers submitted from your department. Not only that – also from different people." And he's right to point that out, because it's one of our major achievements. You know, our research production is not only from one or two faculty members, but from different people publishing in different conferences. And his impression is that our department is moving up quickly and getting better and better. Of course, I feel this way, too, but to hear it coming from other people's mouths makes me feel even happier.
- UBIQUITY: That's great. Are you getting any new support from industry?
- PAN: The level of support from industry is not too high yet. We received some money from Cisco and some money from Scientific Atlanta, but our industry support is still small. Right now, most of our young faculty members are still concentrating on basic research, and the money's coming mainly from NSF (National Science Foundation) or NIH (National Institutes of Health).

UBIQUITY: Now that you've described your department for us, tell us about yourself. What's your own story?

PAN: I was trained in China, and got my Bachelor degree and Master degree from China's top university, Tsinghua University. I came to United States in 1987 and attended the University of Pittsburgh, where I got my PhD in 1991. And at that time the job market was really bad and I had two choices. Of course, one was to go to industry and the other to go academia as a professor. To become a professor was very hard at that time, but I decided that I had spent so much time in research that I should continue my career in academia. So I chose this route and I still feel lucky that I got a job in a university in Ohio called the University of Dayton. UD is a private school. The quality there is very high but the department has no PhD program. It's a teaching department, so the teaching load is heavy; normally a faculty member teaches three courses a semester and can reduce the teaching load a bit but still has to teach at least two courses a semester. So mainly I did research on my own. And then, after nine years at the University of Dayton I decided to move to a research university, so in 2000 I moved to Georgia State University. Of course, I tried several time to move before 2000 and failed.

UBIQUITY: Was it difficult to find a research position after being so long at an institution which was not strong on research?

PAN: Not really, because even though the research program is very weak at UD but I still continued to work hard on my own research. For example, in the three summer months, Dayton can provide some teaching money, but I just refused to do so. I said to myself, "On my low salary, my living conditions will be not so comfortable, but my major agenda is not to be comfortable but to do research. Eventually I hope to move to a research school." So, after nine years my dream came true! I became, first, associate professor without tenure at Georgia State, a research school, and then, after three years, received tenure, and then after another year was promoted to full professor, and after yet another year became department chair.

UBIQUITY: You must have been very proud.

PAN: Yes; one time, a few years back, I was invited as a distinguished alumnus back to my old school, the University of Pittsburgh, to give a talk to students. I proudly told the students, I said, "You're young but your dream will come true if you are persistent. I was a foreign student at one time, and I know it's very hard for foreign students. You know, your language is not good, and because of cultural differences you have many other problems, right? And this is not easy. Pitt's CS Department has produced many excellent students such as professor at UC Berkeley, Young Presidential Award winner, etc. Let me tell you this: In terms of research achievement, I may not be the best student produced, but in terms of my personal achievement I have a lot to be proud of. Think about my situation. I began my career at humble starting point, the University of Dayton, a teaching school with no research program. Yet working on my own over nine years without benefit of a PhD program to support my efforts, I can still do high-quality research and eventually become relatively well-known in my research area. So it's possible to achieve your personal dream. It's not easy. You need courage and determination and persistence. I believe most people after working at a teaching school for many years do not have the courage to move to a research university even though they are also intelligent. I'm very proud of how far I've +come from where I started."

UBIQUITY: And you certainly should be.

PAN: Yes. I came to Pittsburgh because at that time I had no money to pay an application fee, so I only applied to three schools in the United States which would waive my application fee – Iowa State, Pittsburgh and then another one I don't remember anymore. But these schools couldn't give me money, so I went to Canada first, and then I talked again to Pittsburgh, which actually admitted me as the first Chinese student with financial support without studying first at Pitt's CS Dept. In other words, previously, they only considered Chinese students who had already been studying in Pittsburgh for one year and then could achieve let's say a good grade point

average: *then* they gave you financial support. I was the first one without showing anything and they gave me full financial support.

UBIQUITY: That's impressive.

PAN: So after that talk I gave to the students, they came up to me because they felt encouraged, and I said to them, "Wherever you have difficulties – and in your careers you will always have difficulties because you are foreign students and your language is not great – don't spend all your time worrying about how difficult life is, just continue doing what you have to do, and continuing working very hard. Eventually you will succeed!" And my story actually motivated them quite a bit, and some professors told me that my speech was really outstanding. But all I was saying that as a human being, your career path will have both ups and downs, no matter how intelligent you are; sometimes your path goes down, sometimes it goes up. When it goes down, don't worry. Just be persistent, and you will be successful. Your hard work will pay off.

UBIQUITY: That really is inspirational.

PAN: I think so too, and I think it's especially useful for people from foreign countries or from poor families, because they don't have enough financial resources and cannot go to Stanford or Harvard, even though they are smart, great people, they end up at a public university such as University of Pittsburgh or Georgia State University, which are wonderful institutions, but is not yet at the level of Stanford or Harvard. But what I'm saying is that if they really work hard I think they will succeed and realize their dream eventually. Success will happen. That is the story. But success means having a full happy life. Success is defined by yourself. You should consider yourself a big success if you feel happy and you are doing what you want to do. That's your success. Success may not mean holding a high official position; it may not mean big money. But it does mean lots of work, of the kind you like to do to make yourself feel happy. That's success.

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