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Interview with Dr. David Patterson (DP)

Department of Mathematical Sciences
The University of Montana
Missoula, MT 59812

by

Charles Myers (CM)

CM: Professor Paterson, would you please tell me why you chose the U of M?

DP: When I was looking for a job, I was looking to be out west. I had lived in Oregon for a couple of years earlier, and just liked the west. I've always liked it. Some of my family was out here. And, so I applied for jobs both in industry and in academic jobs all in the west. Missoula had a kind of a special appeal to me because when I was a kid—5 or 6 years old—back in '59 or '60, somewhere in that era, my uncle had been a forest ranger up in north west Montana. And we had gone for a couple of extended visits during the summers. We really liked it up there. It's now under Lake Koocanusa where he was.

CM: Oh.

DP: He'd gone to the University of Montana. So my aunt and uncle had fond memories of Missoula. So, I actually got offered jobs both at Bozeman, at Montana State, and at UM. But, I just liked the people here better—the feeling, the collegiality. I like the people at Bozeman, too, the faculty. But I didn't like

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the kind of hierarchy—the autocratic chairman. Here at Missoula, things seemed a little more democratic, and so on. And, so I liked it better and I liked the orientation of this university, being a kind of a liberal arts university with strong music and dance and things like that. That was the kind of university I was interested in.

CM: Great. Was there somebody special who at the time was a mentor or got you interested in mathematics?

DP: I'd always liked math and been good at math in high school. When I got to college, I actually kind of got burned out on it. I'd taken calculus in high school. I took some more calculus in college. And, I found myself not being very enthusiastic about mathematics. I considered becoming a history major for a while. I liked the analytical, critical approach to looking at historical documents and history and so on. I ended up kind of coming back to a math major mostly because it was easier than a history major. Writing papers was always a big chore for me. I actually was, you know, a fairly good writer. But it took so much work that it was easier to become a math major. When I finished my bachelor's degree I really had no interest in pursuing a graduate degree in mathematics. So I was kind of wondering what to do. I went to work in Oregon for a couple of years. But the summer after I graduated it suddenly dawned on me. The one thing I had really enjoyed as an under graduate was the course in statistics. Then I did an independent study in statistical decision theory and statistical game theory, and read, gone through, part of a book by Blackwell and Gershik—David Blackwell, a very famous statistician at Berkeley. And I just loved that book. I kind of think of Blackwell as the one who got me interested in going into statistics, although I had no idea who he was. And, and it dawned on me that that was one area of mathematics that I really enjoyed. And then, couple of years later I didn't really have a mentor. My advisor I kind of chose by default because he was willing to work with me on a project that I had found when I worked a couple summers at Los Alamos National Laboratory while I was a graduate student. Then a project came out of that and he was swilling to work with me on it. It wasn't really his area, so that's how he came t6o be my advisor. But we never worked together on projects after that.

CM: So after that point, statistics then has been the area that you've concentrated on.

DP: Right. And I loved it from my first day in graduate school. It was just... I don't know what I liked about it so much as compared to pure mathematics. But it, maybe it was the.even the theoretical courses I enjoyed in statistics. Maybe it was, I liked it so much because always at the basis there was all this theory had been derived because there were real problems to be solved. And, I don't know. I like modeling and so on, which is fundamental to statistics—models. And so I just really enjoyed that.

CM: What are you currently working on?

DP: A lot of what I do comes out of collaborations with people in other areas. One that's kind of been ongoing for along time has been with an economist, John Duffield, who was on the faculty here and then started his own consulting business on an environmental economics, natural resource, damage assessment, and economic impacts of decisions on... environmental decisions, you know, like reintroducing the wolf. Economic impacts and so on—economic impacts of building dams and so on. And particularly at getting at the .   putting a dollar value on things where it's not easy to put a dollar value on them. For instance, you can easily measure the revenue from producing the power from a hydroelectric dam,. But, what's the cost? Well, its' more than just building the dam. It's also, you've dest4royed a fishery. And what's the value of that? So any kind of environmental impact thing, he's been in this area. Putting dollar amounts on damages like that, which is pretty common now. But he actually was doing it at a time when it was kind of one of the first people to start doing that kind of assessment. So, anyway, there are statistical problems that arise in trying to actually put those values on. And, part of what, how they try to put dollar values on things like that is.   several different ways. By observing people's behavior and also by asking people. That's a difficult problem to figure out how to ask people in a way to really get at the true value to put on something—their willingness to ay for something. I've been mostly involved in kind of the how to, what kind of data do you want to collect? How do you want to collect it? And analyzing the data with statistical models to get a value.

CM: Are... is this, then, an example of some of the things that you have done recently also?

DP: Yeah, this is ongoing. So, for instance, there's a problem I'm working on right now with, a statistical problem of building a model that's appropriate for a certain type of data collection procedure. So. Other things that I work on... I'm associate chair of the department. So sometimes I don't have much time to do other things I'd like to do. I also... one area of interest since my doctoral dissertation has been discriminate analysis or classification of objects. The situation is that you're trying to come up with a rule for classifying, deciding which group an object belongs to. And you have a training set of objects. For instance, if you're trying to sex bald eagles, which are.bald eagles or birds in general are hard to sex if they're not dead. And so, are there measurements you can make on them? You know, measuring their beak length and talon length and feather lengths—all sorts. Can you distinguish between males and females? So you have a sample, a training set which is animals, which were killed or something. And you were able to sex them. And you were able to get all these measurements. And now you are trying to develop a rule for deciding whether an eagle that isn't dead, based on these measurements, whether they're male or female. It's really a decision problem that has applications in just, you know, all sorts of areas. Medicine, you know, classifying, deciding which disease a person has based on whatever information you can get.

CM: So, that was something that you had originally worked on with your dissertation. And it is something that you are continuing to be interested in?

DP: Yes, yes.

CM: What changes have you seen at the U of M since you've been here?

DP: Let's see. When I came here in the fall of 1985, I was the first new faculty member in mathematics in, I'm not sure, perhaps 10 years. So I was really the young kid at that time. And, a couple of years later, excuse me, somebody else came. We got a new person every couple of years after that. But, in the last five years it's really accelerated, where a lot of the group that were the senior members when I came in are retiring. The turnover's amazing. I mean we really have a very different department than when I first came. There's been a lot of good come out of that. I think we're really, got a lot of rally good people come in. Strong teachers, strong researchers, People who've generated a lot of activity in the department in terms of conferences and speakers and so on, and working with students. I think there's, there seems to be a little more friction maybe sometimes in the department than there w was when I fist came here. Maybe I'm misreading that because when I first come here I was the young faculty member and didn't know too much what was going on. And I think that friction may be partly just due to that there are a lot of good people who have different interests, trying to promote their own interests. What they think is important for faculty to do. And there are differences of opinion there. As far as the university goes, there are a lot more students. There were, I can't remember, 8000 or so when I came. Now there's 11,000. I liked it more with the 8000. I just like it a little less crowded. There aren't more students in most of our upper-level classes. That's stayed pretty steady, fluctuates a lot. We've gone to at the lower level; there are a lot more sections of courses. I teach our introductory statistics course, which when I first came here we just taught a few sections—small sections each quarter. Now it's a large lecture class. And I liked it better when we taught it in small sections. That's not feasible without staffing any more.

CM: Are there different people involved? Not mathematicians as much, or statistics majors, as people from other departments, now?

DP: Involved in what?

CM: In your lower level class.

DP: Not faculty from other departments, But, I guess students. I guess we're getting.   I guess when I first came here; perhaps, I think there were some departments had their own courses. Like business may have had their own course and now they use our introductory course as their first course.

CM: Now, where do you see mathematics headed in the next century?

DP: You know, I don't think too much about mathematics in general. I think more about statistics.

CM: Okay.

DP: Interesting question. I guess just keeping up on where it is going is, takes enough time. I don't think too much about where it is, where it's going to go. Certainly in statistics the big issue—probably the biggest issue today—is dealing with massive data sets. I mean, you know, massive, massive, billions and billions of data points, and how to, how to develop software and algorithms for looking for patterns, and so on, in massive data sets like that. You know where statisticians traditionally are sued to looking at small data sets, ones you could draw pictures of by hand or with a computer. And now we're looking at these stupendously large data sets. So much information's being generated without really much idea of what to do with it. You know there are all sorts of problems with massive data sets. I mean there are errors, you know. And that can be a huge problem. So, a lot of statistics is going, looking at massive data sets. Also, a lot more common than when I fist started out are computationally intensive procedures. We, in classical statistics, made certain assumptions and then mathematically you could work out what, what the distribution of something was or what procedure you should use. And now people are trying to get away from that and using the often computationally intensive procedures that don't make assumptions about, as many assumptions about where the data, type of distribution the data came from, and so on.

CM: Okay.

DP: Which I think is really good. It takes a while to get out into the users.

CM: One last question. Could you think of an anecdote or do you have a fondest memory that king of, about the u of M or about your department, or anything like that, that you'd like to share?

DP: Huh, I uh. I wasn't prepared for that one. I have to.   I'd have to think about hat one.

CM: Maybe something that lets you know why you like living here or working here or something.

DP: Well I can't think of a specific anecdote off the top of my head. But, one thing I've just really enjoyed about being here is it's .. .you know, when I came here I became a cross-country skier. I'd never really; I'd hardly ever cross-country skied before. I just fell in love with it, and back country skiing. You know, I'd always like hiking and so on. And just the opportunity to do it here, it's just been

wonderful. And just.. .I'm just always stunned, the... Being able to ride up the Rattlesnake or go hiking on Mt. Jumbo, or drive a few miles from town and be in wilderness, it just continues to just stun me. Since I grew up in and around "Boston and then lived in Iowa for a long time, which ... I loved Iowa, but it just, it still just amazes me.

CM: That's a pretty good reason. I imagine it's the reason an awful lot of people live here.

DP: Yeah, yeah.

CM: Well, okay. That's it. Thank you.