Rebecca Mercuri: BMC's Electronic Voting Expert

by juliana rosati

It was the Sunday after the as-yet-undecided 2000 presidential election. As the nation wondered in tense disbelief when it would finally know the name of its next president, the telephone rang at Bryn Mawr Computer Science professor Rebecca Mercuri's home.

"I pick it up, and this guy identifies himself as an attorney for the Vice President," she recalls. Laughing, Mercuri remembers her initial moment of unspoken amazement.

"I was like, 'well, there's really only *one* Vice President.'" The events which followed were unforgettable, surprising, and extremely exhausting for Mercuri, as her expert opinion was widely sought across the country. At the same time, they were in many ways events for which she had been preparing for much of her life.

Mercuri, who began teaching at Bryn Mawr last fall, holds her bachelor's and master's degrees in computer science from Pennsylvania State and Drexel Universities respectively. The founder and president of Notable Software, Inc. in Lawrenceville, New Jersey, Mercuri has published numerous articles and papers on the topic of electronic voting machines, collaborating on several papers with her colleague Peter Neumann, an expert on computer security issues, over the past ten years. She has worked as an expert witness and system examiner in the field of electronic voting, doing mostly *pro bono* work, and has also been a paid expert witness through Notable Software.

Mercuri successfully defended her Ph.D. thesis, entitled "Electronic Vote Tabulation Checks & Balances" at the School of Engineering and Applied Science at the University of Pennsylvania on October 27, 2000, just days before the national election. In it she explained problems with fully computerized voting machines, called Direct Recording Electronic, or DRE machines, as well as with the prospect of Internet voting.

Mercuri opposes the use of DRE systems. She points out that they do not include a backup paper record of the votes. Information is recorded electronically inside of a machine when a voter presses buttons on the outside. Such systems do not provide any way for the voter to confirm that what appears on the screen actually corresponds to what is being recorded inside of the unit. Mercuri believes that a good alternative would be an electronic machine that also provides printouts. Each voter could then check that his or her vote was recorded correctly, and the printouts would be kept to back up the electronic records, making a recount possible. She believes that a paper record is crucial because DREs are capable of losing data without a trace.

Mercuri also opposes the idea of Internet voting, as it would introduce a host of problems such as privacy and tampering with votes, which she says cannot be effectively dealt with at present. She actually prefers the older voting machines with levers, as well as systems involving paper ballots, over new electronic ones. She says that despite their flaws, the old systems at least allow the voter the ability to verify the process.

The field of electronic voting combines two of Mercuri's foremost interests: computers and politics.

Her involvement in grassroots campaigning began in high school, and for the past fifteen years she has worked as a volunteer at polls on election day. She says she has found that most people who volunteer at the polls are "really dedicated to the process." Mercuri views this element of direct human involvement in democracy as "the beauty of the way that Americans run elections." It is something she fears would be lost with a conversion to Internet voting.

Back in the fall, after facing the challenge of beginning her first semester at Bryn Mawr while finishing her dissertation, Mercuri anticipated calmer times. After defending her thesis she believed her life would quiet down somewhat and that she would finally "get some sleep." A week and a half later, election night came.

"It's not like I became famous overnight," Mercuri explains. "I worked on this for ten years, and the all of a sudden a lot of people wanted to hear what I had to say." Her involvement in the area of electronic vote tabulation dates back to 1989. Mercuri was fascinated by an article about election anomalies by Ronnie Dugger, published in *The New Yorker* in 1988. When, as a new resident of Yardley in Bucks County, PA, she discovered that county officials planned to purchase expensive new DRE voting machines, she tried to dissuade them. Using the article to back up her claims, she ultimately succeeded. In the process she came into contact with Mae Churchill, the founder of Election Watch, an informal group which investigated stories of election irregularities across the country. Churchill subsequently enlisted Mercuri to testify before New York officials in an her effort to prevent the city from buying $60 million worth of electronic voting equipment. The first woman to receive a Ph.D. from the University of Pennsylvania's Wharton School of Economics, Churchill served as a mentor for Mercuri. Watching what Churchill was able to accomplish in New York, Mercuri says, she learned that "one person really could make a difference."

Mercuri, along with other experts, continued to work on similar issues. After Churchill became ill and was unable to continue with her projects, people turned to Mercuri with reports of election anomalies. She became, in her own words, "the center person that people would call." This role gave her access to information with which she would not have become familiar through personal research endeavors alone. This experience would eventually put her opinion in high demand by the press following the 2000 election.

On election night 2000 Mercuri was at incumbent New Jersey Democratic Representative Rush Holt's party in Princeton, having worked as a volunteer for his campaign. When the situation in Florida first became apparent, she was not surprised. Familiar with other cases of election irregularities in that state, including a 1993 city election in St. Petersburg in which a manual recount was found necessary, she recalls thinking to herself, "Florida, yeah, they're notorious."

In the aftermath of the election later that week, with the media reporting nonstop on the Florida situation, Mercuri decided to update her website (http://mainline.brynmawr.edu/~rmercuri/) so that the press could become aware of her expertise. Literally minutes after it was finished, she received her first call from the Associated Press in Tallahassee.

The reporter, who had her website in front of him, asked her to comment on the error rates of the punch-card reading machines. She estimated them as being "in the range of 2 to 5 percent." Mercuri explains the situation thus: "When you've got an election that's tighter than 2 percent, you're really in the margin of error . . . when you're talking about a million votes, you're talking about a lot of votes

[that] are being thrown out. We say every vote counts . . . but they *don't* all count."

On Sunday afternoon the call from Al Gore's legal team came. The lawyers had been trying desperately that weekend to reach Mercuri before finally finding her home phone number; on Monday morning offices across the Bryn Mawr campus would discover messages on their answering machines from the Gore lawyers asking for Mercuri.

One of the first hearings about whether or not a recount should take place was scheduled for the very next day, and Mercuri was requested to provide a sworn affidavit explaining the necessity for a hand recount. She was also asked to stay on standby in case the court should require her to appear to deliver the statement in person. "So I stayed up all night on Sunday night," she remembers vividly. "We finished the affidavit at 5 a.m. At 7 a.m. I went to the notary to get it notarized. I then drove to Philadelphia and handed it to an attorney who was going to take it to a plane, and it all had to be done by hand — it sort of felt like I was in a spy movie!" Looking back on an election that will be remembered as one of the most unpredictable in history, Mercuri comments, "It's sort of exciting to be there at the moment when this is happening."

Initially, she says, the Gore attorneys asked her to refrain from talking to the press "because that could actually change my use as a witness." Her affidavit ended up not being presented in the Florida case, but was instead used later that week in the Eleventh Circuit Court of Appeals in Atlanta. Once the case had gone through, the Gore lawyers encouraged her to talk to the press as much as possible, in order, she says, "to help the public understand why there was a necessity for the recount."

The result was near pandemonium. "I was literally *deluged* with phone calls," she says. While working on her thesis her normal amount of sleep had been 4 hours per night. It now became 15 minutes. "You've got the east coast and the west coast . . . it just doesn't end." Even today she receives 3 to 5 calls a week — an amount which, she says, is "still crazy."

Reflecting now, post-election, on the problem of voting irregularities, Mercuri comments ruefully that she feels "if anything, it's worse now than it ever was." In the aftermath of the problems with punch-card ballots in Florida, she says, officials across the country are too eager to adopt new electronic voting systems which are not subject to national standards and which she describes as unreliable at present. Mercuri views the prospect of quickly converting to electronic systems as "out of the frying pan [and] into the fire." In the absence of any national standards for voting machines, she says communities would be relying solely on the word of the manufacturers for assurance that the DRE machines work — a situation she describes as "horrifying."

She and her colleagues, she explains, are now "really trying to help people understand that there are serious, major problems with rushing to the new technology, in particular the fact that these things just have not been out there all that long." Today she views her most important task as "trying to influence. . .legislatures at the state, county, and federal level to really look long and hard before they jump into spending what they're estimating." Additionally, she says, new machines will quickly become obsolete if and when the federal government sets standards for them. She warns that communities replacing their machines today could find themselves before long with systems that do not meet required standards. Mercuri hopes that within the next couple of years, at a mandate from Congress, national standards for testing the machines will be developed. She believes that the project should not be done hastily, given its importance.

In the upcoming months Mercuri will continue working to increase awareness of her concerns, speaking at Capitol Hill briefings and various conferences, including one in Boston this week. "Some weeks I feel good about it and some weeks I feel like we're losing," she admits. "The good news is. . .I am getting listened to." Still, although she is pleased with many of the articles about her, she finds that "I'm usually looked upon as the dissenting opinion — like this egghead computer scientist at Bryn Mawr College that thinks this is a *bad* idea."

With a decade of work in the field of voting machines, had Mercuri ever imagined the occurrence of a national election crisis like last November's? "I have to say yes, I did imagine it happening," Mercuri states, her voice still full of incredulity. When she defended her thesis on October 27, she was asked why she was so concerned about the irregularities of voting machines. Mercuri replied that such flaws could potentially turn the tide of a national election. However, she explains, "I was concerned about someone throwing an election *deliberately*, not just buffoonery of chad." She thought the problem would occur because fully electronic machines would lose data without a trace, and not, as she says, because "individuals would not care to recount the data that they have." Nevertheless, Mercuri continues to find it "rather scary" that a national election disaster would happen within days of her publicly declaring it a possibility.

Mercuri says she has "really enjoyed" her experience at Bryn Mawr so far, although the events of the past four months have taken their toll. "I think if I hadn't defended my thesis and helped in a national calamity," she reflects with a laugh, "I might have [been able to spend] more time here." The women's college environment is something that Mercuri particularly appreciates. "As a woman in computer science I have very few women mentors," she says. "It's nice to be here and to see women enthusiastic about computers."