

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WISCONSIN

GREAT AMERICA PAC,
STOP HILLARY PAC, and
RONALD R. JOHNSON,

Plaintiffs,

-against-

WISCONSIN ELECTIONS COMMISSION,
and MICHAEL HAAS, in his official capacity
as ADMINISTRATOR OF THE WISCONSIN
ELECTION COMMISSION,

Defendant,

JILL STEIN,

Intervenor.

No. 16 Civ. 00795

**DECLARATION OF
DOUGLAS W. JONES**

DOUGLAS W. JONES, declares, under penalty of perjury, pursuant to 28 U.S.C. § 1746, that the following is true and correct:

1. I am an Associate Professor of Computer Science at the University of Iowa. I have a BS degree in physics from Carnegie-Mellon University and MS and PhD degrees in computer science from the University of Illinois. I have taught at the University of Iowa since 1980. I submit this affidavit in opposition to plaintiffs' motion for a preliminary injunction.

2. My involvement in elections began in late 1994 when I volunteered to serve on the Iowa Board of Examiners for Voting Machines and Electronic Voting Systems. I was appointed to the board in 1995 and resigned from the board in 2004. I was chairman of the board in 2000, when I testified before the U.S. Commission on Civil

Rights about the Florida 2000 election, and before the House Science Committee about an early draft of what would later become the Help America Vote Act of 2002.

3. In 2004, I consulted with Miami-Dade County, Florida about problems they were having with their then-new voting system. In 2006, I helped investigate a problematic recount in Maricopa County, Arizona for a committee of the Arizona Senate. Earlier in 2016, I was a member of the Scott County, Iowa ad-hoc committee to select a new voting system for that county. I have served as an election observer in Kazakhstan in 2005 and 2007, and in Holland in 2006.

4. Between 2005 and 2011, I was a co-principal investigator in ACCURATE (A Center for Correct, Usable, Reliable, Auditable, and Transparent Elections), a 5-university research project funded by the National Science Foundation, and I served on the U.S. Election Assistance Commission's Technical Guidelines Development Committee from 2009 to 2012 when the committee went dormant. I co-wrote, with Barbara Simons, the book Broken Ballots, published by the Center for the Study of Language and Information and University of Chicago Press in 2012.

5. My up to date curriculum vita is attached as Exhibit A.

6. Many of my public statements about voting are indexed on-line at

<http://www.cs.uiowa.edu/~jones/voting/>.

My Opinion

7. If our goal is to give as nearly equal weight as possible to the intent of each voter, then we must recognize that every voting technology has its shortcomings and that every use of voting technology must be evaluated in the context in which it is used. For that reason, I support the use of an optical scan ballot on election day and, where an audit is not available under state law, a recount, including a hand recount of the optical scan ballots and the DRE paper trails. A recount, preferably by hand, is the best way to determine voter intent and equalizes distinctions between voters that arise on election day, i.e. by use of different voting technology. A hand recount is also the only way to determine if there was any cyberattack and ensure voter confidence in the results of the election.

The Importance of Recounts to Equalize Voter Treatment

8. In my experience, hand-marked paper ballots that are then scanned by ballot tabulating machines, as used in localities throughout the state in Wisconsin, are the best available technology for conducting a general election in the United States. I understand that some parts of Wisconsin use DRE machines with a paper trail, and some Wisconsin localities hand count their votes. I support use of ballot scanning software because, when multiple races must be tabulated, hand counting is too prone to clerical error, and we have ample evidence of the problems posed by the user interfaces of computerized direct-recording electronic voting machines. In recounts, where only a single race is being counted, the risk of clerical errors is greatly reduced and hand counts are the best choice.

9. That said, no optical scan technology, including that used in Wisconsin, is capable of perfectly uniform and reliable scanning and electronic tabulation of voter-marked ballots. The same ballot scanned by the same genuinely impartial machine may be seen as containing a vote on one pass through the scanner and not containing a vote on the next pass through the identical scanner. Most marks made with the intent of casting a vote will be counted, and most accidental marks and smudges will be ignored. However, problematic marks are possible, both marks intended as votes that some scanners will ignore, and accidental marks that may be counted as votes. A few marks that are obviously not votes, to a person, can be counted as votes by some scanners, and some that are obviously votes will be ignored by some scanners.

10. My analysis of the data from the unofficial Florida 2000 recount done by the media shows that from one to ten votes per thousand votes counted involved a problematic mark; with considerable variation between local jurisdictions. Mark Ritchie, who was the Minnesota Secretary of State during the 2008 senatorial hand recount of optical scan ballots, informed me that the rate of problematic marks in that election was on the order of one or two marks per thousand votes cast.

11. When the margin in an election is wide, this is unlikely to make any difference, but when the margin is small, this can be a problem. The statewide totals published by the Wisconsin Elections Commission on Nov. 23 show a margin of 0.75 percent (7.5 per thousand) between the leading candidates. This is within the range of problem ballot markings observed in Florida 2000 but larger than the rate of problem ballots in the Minnesota 2008 recount. Furthermore, the state reports a “scattering” of invalid write-in votes at a rate of 0.87 percent. I note that the Wisconsin Elections

Commission data does not indicate the number of undervotes – that is, ballots where the scanner saw no presidential vote.

12. A manual recount of the ballots can address the problems of scanner accuracy and voter misunderstanding of the purpose of the write-in blank. A hand recount offers meaningful assurance that borderline marks on ballots are correctly interpreted. It can compensate for local differences in how over-voted and blank ballots are handled. A hand recount can also reveal whether a ballot scanner has been hacked with malware. The security requirements set by current voting system standards are rudimentary at best and products built to these standards are vulnerable. Specifically, Harri Hursti has demonstrated several attacks on the AccuVote OS scanners used in Wisconsin, showing how easily those machines can be hacked. The Ohio EVEREST report and the California Top to Bottom Review—inquiries commissioned by those states to examine the security risks of voting machine technologies—found serious vulnerabilities in every voting system they examined. For example, in addition to the AccuVote OS system, the California Top to Bottom Review found “significant security weaknesses throughout the Sequoia system,” including the Sequoia Insight tabulator, which is in use in Wisconsin. And the Ohio EVEREST report found that the ES&S M100 optical scan systems—which are used by more than 100 municipalities across Wisconsin—“lack the fundamental technical controls necessary to guarantee a trustworthy election under operational conditions. Exploitable vulnerabilities allow even persons with limited access – voters and precinct poll workers – to compromise voting machines and precinct results, and, in some cases, to inject and spread software viruses into the central election management system.” Fundamentally, because all voting

machines are computers, they are all vulnerable to cyberattacks, and we know that we cannot rely on pre-election testing to detect hacked voting equipment because there are well-known ways of evading such tests. Therefore, again, examination of the ballots is essential.

13. It is noteworthy that the 2015 Wisconsin Act 261 allows election inspectors significant discretion in the use of the override function when overvotes are encountered *on election day*. This means that in some Wisconsin jurisdictions, overvoted ballots may have been simply counted, while in other jurisdictions, overvoted ballots will have been returned to voters or to the canvassing board for re-making. The Wisconsin Election Day Manual, on page 98, recommends but does not require uniformity of treatment within any one jurisdiction.

14. In contrast, *during a recount* Wisconsin inspectors must evaluate voter intent on overvotes (for both manual and automatic recounts), using detailed standards described below.

15. Accordingly, a recount significantly improves the voters' likelihood of having their votes counted as intended and diminishes the impact of local variations between the types of machines used and the procedures employed to handle overvotes on election day.

Wisconsin's Instructions to Its Ballot Inspectors concerning Recounts

16. I have long advocated uniform standards statewide for recounting ballots.

17. I have reviewed Wisconsin's standards for determining voter intent in the Wisconsin Elections Commission manual entitled Counting Votes at the Spring Primary,

Spring Election & General Election, revised August 2014; these instructions are cited in the Election Recount Procedures manual of November 2016. While these procedures are not perfect, they will significantly reduce the number of voters whose vote is not counted as intended on the first count.

18. Wisconsin provides detailed instructions to its ballot examiners on *how* to evaluate voters' marks to determine their intent. I consider Wisconsin's manuals appear to be quite good.

19. I have also read Wisconsin Statutes, Section 7.50(2) discussing the determination of elector intent. The statutes and the Counting Votes manual complement each other. Taken together, the statute and manual provide excellent guidance for ascertaining voter intent.

20. To take just some examples, Wisconsin instructs examiners what areas on the ballot should be reviewed for marks, provides examples of the types of marks that should be counted, and provides insight on how to address erasure marks. It specifically instructs examiners how to deal with the "enthusiastic voter," the voter who both marks the section for his or her candidate *and* writes that candidate's name in the "write in" line.

21. These guidelines, in my opinion, provide substantial instruction to ballot examiners and diminish the chance that different ballot examiners will apply the "intent of the voter" standard differently.

Wisconsin Today vs. Florida in 2000

22. The Florida recounts of 2000 raised serious questions about determining voter intent that are not raised in the 2016 Wisconsin recount.

23. I researched punched-card ballots of the type that were used in the Florida 2000 election (the Votomatic and Data-Punch voting machines). I reported some of my experiments with punched-card ballots in my testimony before the U.S. Commission on Civil Rights during their Jan. 11, 2001 hearing in Tallahassee. All of my experiments with Votomatic ballots are available on my website:

<http://www.cs.uiowa.edu/~jones/cards/chad.html> (last updated, January 2006).

24. During the Florida recount, it was generally agreed that a piece of chad hanging by one corner was intentionally punched by the voter, while a piece of chad hanging by three or more corners was agreed by most to be unpunched. Chad hanging by two corners was the subject of debate.

25. After the 2000 Florida recount, I conducted experiments to determine if those distinctions based on the number of corners left on the chad were consistent with voter intent—i.e. was it true that a piece of chad hanging by one corner or just dimpled was likely not intentionally punched by the voter?

26. My experiments revealed that standards based on the number of detached corners make no sense. I discovered that the effect of the amount of force a voter used varied widely depending on how well the voting machine was maintained. In fact, the force required to punch that piece of chad on a well maintained voting machine was *less* than the force that would only dimple a piece of chad without detaching any of its corners on a poorly-maintained machine. So whether a chad was merely dimpled or pushed out entirely was more a reflection of maintenance history than voter intent.

27. Yet these standards appear to have lasted from the invention of the Votomatic card ballot by Joseph P. Harris in the mid-1960s all the way to the end of the

punched card era. The survival of such flawed standards until the end of the punched card era demonstrates that human intuition is not a particularly good guide for interpreting a punched-card chad. Counting corners on chads is far removed from the everyday experiences of almost all of us. Human interpretation of dangling or dimpled chad requires technical expertise that was largely unavailable in Florida in 2000.

28. In contrast, paper ballots marked with a pen or pencil are very close to our everyday experience. Children begin their formal study of pen and pencil marks on paper in kindergarten, and by the time we graduate from high school, we have had years of formal study and informal experience making marks on paper and interpreting the meanings of those marks. The average person can easily distinguish erasures and smudges from deliberate marks and can easily discern intent in people's marks on paper.

29. An inspector looking at an optical scan ballot has years of real-life experience to understand the voters' likely purpose in marking an X, for example. The inspector, based on his years of experience with pen/pencil marks, can discern the import of that X in a way that an inspector looking at a hanging chad could not.

30. Additionally, the punched card ballots used in Florida are fragile, so each time they were counted, the record of voters' intent could be inadvertently altered. In contrast, Wisconsin's optically scanned paper ballots are a completely different technology. Wisconsin law requires that they create a persistent and readily interpretable record of voters' intent. Wisconsin ballots can be counted efficiently and accurately in a manual recount. In my experience counting and recounting paper ballots on optical scan vote tabulators, I have run a deck of ballots through multiple tabulators as many as 12 times without any substantial damage to the ballots, despite my using a wide

range of different pens and pencils to mark the ballots. I would not expect punched card ballots to stand up as well to such treatment, particularly where there is any dangling or dimpled chad in question.

Dated: Iowa City, Iowa
December 7, 2016

DOUGLAS W. JONES