

# **Current Research in Voting, Elections, and Technology**

**[To Appear in *Social Science Computer Review*, *Pagination may Differ*]**

Micah Altman, Harvard University

Gary M. Klass, Illinois State University

## **Abstract**

The articles in this special issue raise and refine questions about our understanding of the use of, state of the art in, and challenges associated with voting and election technology, broadly conceived. Although researchers have yet to achieve consensus on the broad impact of information technology on our understanding of the practice of politics, the broad outlines of a research agenda are emerging. In this overview, we discuss the current work, and identify important research questions that remain to be addressed.

**Keywords:** information technology, research questions, research agenda, technology, politics, political science, E-voting, online survey methods, agent-based models, online campaigning, redistricting technology

## Author Information

**Micah Altman** (Ph.D., California Institute of Technology), is Associate Director of the *Harvard-MIT Data Center*, and a Research Associate in the *Center for Basic Research in the Social Sciences* in the *Faculty of Arts and Sciences* at *Harvard University*. Dr Altman also serves Co-Investigator in several research sponsored projects which aim to promote the sharing, preservation, and citation of research data by building open-source software tools. Dr Altman's work has been recognized by the Supreme Court, and by *Who's Who in America*. His recent book (with Jeff Gill and Michael McDonald), *Numerical Issues in Statistical Computing for the Social Scientist*, corrects common computational errors made across the range of social sciences. And his over two dozen publications and open-source software packages span the fields of political science, statistics, history, geography, law, and computer science.

Email: [Micah\\_Altman@harvard.edu](mailto:micah_altman@harvard.edu) Web: [http://www.hmdc.harvard.edu/micah\\_altman/](http://www.hmdc.harvard.edu/micah_altman/)

**Gary M. Klass** (Ph.D., Binghamton University) is an associate professor of politics and government at Illinois State University. His recent work involves the analysis of instructional technology and the graphical display of numerical data,

Email: [gmklass@ilstu.edu](mailto:gmklass@ilstu.edu); Web: <http://lilt.ilstu.edu/gmklass/>

# Current Research in Voting, Elections, and Information

## Technology

Long before butterfly ballots and pregnant chads called the public's attention to the matter, political scientists were systematically investigating how information technology shapes election processes and outcomes. Perhaps the first analysis of the impacts of technology on elections was Philip Loring Allen's 1906 study of the effects of variations in state balloting procedures. Allen developed measures, still in use today, of split-ticket voting and what would later be called "roll off" to evaluate the fairness and reliability of a variety of voting procedures. Writing in the tradition of the progressive reform movement that was a force in both American politics and American political science at the time, Allen recognized that voting technology was not necessarily politically neutral and was especially critical of the effect of voting mechanisms that favored the "spoilsmen" over the independent voter, while acknowledging that these technologies had disparate impacts on the educated and uneducated classes. In particular, he complained, the recently adopted mechanical voting machines (first used in Rochester, New York in 1892) were "virtually allowing the designer of the machine to nullify the provisions of the election law" (1906 58). Anticipating similar arguments made by election observers a century later, Allen's concluding words expressed his frustration with the voting processes of his day:

"Railroad companies have conducted expensive tests to determine what style of type in their time-tables will be read with the minimum of mistakes and thus save their patrons from missing trains through misreading the starting time. At least as careful attention should be given to the make-up of the most potent of all sheets of paper, the ballot" (58).

In the relatively short period of time since the microcomputer revolution, it has become generally accepted that IT has had, and continues to have, a significant and widespread influence on politics. Changes in information technologies also, instrumentally, offer challenges to the methods and institutions of campaigning, voting, and elections, broadly conceived.

While the United States 2000 election will be remembered for its hanging chads, the year also marked the first votes cast over the Internet in the Arizona Democratic presidential primary, in Alaska's Republican party's anachronistically named "straw vote", and in 84 official ballots cast by overseas citizens in the presidential general election (Alvarez and Hall 2004). Despite the passage of the "Help Americans Vote Act" in 2002, political controversy over American electoral procedures shows little prospect of abating. Under the spotlight of the 2004 U.S. presidential election, several uses of information technologies in elections have risen to the attention of the press and sparked controversy both among academics and the general public. (see Foster 2004; Novak 2004) Among the events of the year were the halting of the Pentagon's SERVE project for Internet voting (as an alternative for casting overseas absentee ballots) because of concerns for security.

Allegations of vote manipulation, and widespread calls for verifiable audit trails for all electronic voting systems continue.

Journalists reported on the use of detailed voter databases to implement push campaigns to “microtargeted” groups, and raised strong concerns regarding the impact of such databases on privacy, and the use of technology to enable qualitatively different sorts of voter manipulation. (Gertner 2004, also see Farhi 2004) Many other journalists and pundits have reported on the surprising effectiveness of Internet fundraising by Howard Dean, John Kerry, and others, (see, e.g. Appell 2004; Schlesinger 2004; Stone 2004 ) and speculated on whether the Internet radically changes fundraising and voter mobilization, as both conservatives and liberal activists have claimed (Trippi 2004; Viguerie, et. al 2004).

Such concerns are not limited to the press. In *Vieth* (2004) although the plaintiff’s claims of an unconstitutional partisan gerrymander were ultimately rejected, two Supreme Court justices, quoting numerous law professors and social scientists expressed grave concern that computers have changed redistricting, and removed fundamental constraints against gerrymanders. In the US, one of the few remaining liberal democracies that has not instituted independent constraints on political gerrymandering, the prospect of a California referendum that would reform the state’s redistricting process promises to enliven public debate over redistricting technology.

The features in this special issue explore the role of information technology in campaigning, voting, and elections. They provide some of the first rigorous examinations of these issues and develop insights for future research. Many of the articles focus on evaluations of information technology in voting, others discuss redistricting, campaigning, evaluation frameworks, and methodology.

Our first set of articles evaluate the new forms of electronic voting. In “Early Appraisals of Electronic Voting”, Paul Herrnson et. al. examine the usability of touch-screen electronic voting systems. Using multiple methodologies they subject the Diebold AccuVote-TS voting system to a systematic and comprehensive evaluation, concluding that these systems are relatively usable and have some unique advantages: However they have shortcomings, including some that have raised concerns among a subset of voters.

While replacing the mechanical lever machines, punch card machines and the simple paper ballots with touch-screen computers represents an incremental change in voting procedures, casting votes over the Internet portends a more fundamental transformation of election process. Thus, in “To I-Vote or Not to I-Vote?”, Kate Kenski assesses Arizonan’s views of Internet voting following the state’s 2000 Democratic presidential primary. Nearly half of the respondents expressed their distrust of Internet voting, with ballot security being their primary concern. Kenski notes that levels of public trust can be expected to change significantly as voters gain experience with the new technology, but of considerably greater import is her evidence that Internet voting will have significant effects on the demographic and ideological composition of the electorate:

Independents, Democrats and liberals were more likely to indicate that they would take advantage of the technology.

The two articles that follow look at the role that technology and public trust of the technology plays in voting and the election process generally. In “Trust, Identity, and the Effects of Voting Technologies on Voting Behavior”, Anne-Marie Oostveen and Peter van den Besselaar report on their initial analyses of a field test of two voting technologies. They find that the effect of alternative voting media on voter choice is conditioned by the degree of trust voters have in the voting system. While Oostveen and van den Besselaar explore the narrow question of voter trust in a particular voting technologies, the second article addresses the broader issue of trust in the entire voting process. Whatever the voting technology, the public also has to place their trust in the people who manage the voting process. Thus, in “Trust Analysis of the UK E-Voting Pilots”, Alexandros Xenakis and Ann Macintosh, explores general issues of trust and electoral participation in an analysis of 16 pilot tests of electronic voting technologies conducting in the United Kingdom in 2002. They propose both a multidimensional understanding of the concept of public trust and assess its role in relationship to different stages of, and actors involved in, the electoral process.

The last articles address aspects of information technology in other parts of the electoral process. In “When Methodology Interferes with Substance,” Harald Schoen and Thorsten Faas examine both 2002 German voter attitudes toward e-voting, and the effectiveness of on-line survey methodologies themselves. Their findings confirm and elaborate on previous research which shows that online surveys yield biased results that are not corrected by demographic controls. Additionally, they report evidence that e-campaigning has reached only a small and generally unrepresentative fraction of the electorate.

In “From Crayons to Computers: The Evolution of Computer Use in Redistricting”, Micah Altman, Karin MacDonald and Michael P. McDonald present results from a complete survey of every state-level redistricting authority. By combining these results with an analysis of the capabilities of each redistricting software system they develop a systematic qualitative and quantitative assessment of the nature and extent of the use of computer technology in redistricting.

Finally, Christian W. Martin and Thomas Plümper provide a demonstration of how advances in information and computing technology can support new types of methodological inquiries into voting behavior. In “Number of Parties, Endogenous Partisan Preferences and Electoral Turnout Rates” use an agent-based model to explore the impact of number of parties, alienation, and abstention on turnout.

## **Future Directions**

In the future will touch-screen and Internet voting be as commonplace as punch cards and lever machines were in the twentieth century? Will e-campaigning be as pervasive as, and perhaps indistinguishable from, radio and television campaigning? Will Internet surveys

be as reliable, or unreliable, as telephone survey? And will elected politicians use redistricting to pick their voters, instead of the other way around? Whatever happens, social scientists will monitor this transformation to see how it affects "who gets what, when and how".

At this time, researchers have yet to achieve consensus on the broad impact of information technology on our understanding and practice of politics, or even on the proper definitions of terms such as "e-voting", "e-government", and "e-democracy". The broad outlines of a research agenda are emerging, however, to address such fundamental questions as: How has information technology most influenced elections and electoral institutions? How are candidates, campaigns, interest groups, redistricters, and other political actors using information technology to create new political strategies or institutional forms? How has information technology changed the ability of these actors to influence politics? How does such technology affect the status quo? What theories and methods are most useful for the study of information technology and elections?

Following in Philip Loring Allen's footsteps, social scientists will continue to explore the often disparate political and social impacts of new voting technologies on participation in political and governing processes.. They will consider how implications of the new technology relate to other proposals for reforming election procedures and will investigate how candidates, campaigns, interest groups, redistricters, and other political actors apply information technology to create new political strategies or institutional forms. Committed to openness and transparency in governing processes, social scientists will research questions and agendas with respect to information technology and public administration, regulatory policy, digital government, and electronic rulemaking (see Garson 2003; Coglianese 2004; Fountain 2003; Shulman et. al 2004, respectively).

In addition to these fundamental questions, a host of topical questions are ripe for further research. Will electronic voting create more fair and reliable outcomes? How has voter database technology affected privacy, openness, and trust in elections and electoral institutions? How can the Internet and other information and communication technologies be used to broaden and deepen citizen engagement?<sup>1</sup> What is the size, shape, and significance of the "digital divide" with respect to electoral participation and more general political participation? Will the Internet democratize political fundraising? How does voting technology affect trust in the electoral system? How does the deployment of information technologies in elections affect the sociodemographic and ideological makeup of future participants? How does public trust and other political forces foster or inhibit the diffusion of the new technologies?

Clearly, this an ambitious research agenda and important questions remain to be addressed or discovered. Research on the relationship among information technology, political actors, electoral methods and electoral institutions is key to understanding these questions and to influencing the development of government and governance in the future. As this special issue shows, this research is underway, and is beginning to bear

---

<sup>1</sup> We are indebted to Alexandra Samuel for raising this question.

fruit. Continuation and expansion of these lines of research is likely to have tremendous impact both on our understanding of politics and in how politics is conducted. We are only at the beginnings of this process.

## References

- Allen, P. L. (1906). Ballot laws and their workings. *Political Science Quarterly*, 21(1), 38-58.
- Alvarez, R. M. and Hall, T. E. (2004) . Point, click, & vote: The future of Internet voting. Washington: Brookings Institution Press.
- Appell, D. (2004). US campaign trail takes to the net. *New Scientist*, Aug 21, pg. 24.
- Coglianesse, C. (2004). Information technology and regulatory policy: New directions for digital government research. *Social Science Computer Review*, 22: 85 – 91.
- Farhi, P. (2004). Parties square off in a database duel. *Washington Post*, July 20, 2004 Tuesday Final Edition, A1.
- Foster, A. L. (2004). Experts remain at odds over e-voting. *Chronicle of Higher Education*, 51(12): A19
- Fountain, J. E., (2003). Information, institutions and governance: Advancing a basic social science research program. Working Paper RWP03-004, National Center for Digital Government.  
([http://www.ksg.harvard.edu/digitalcenter/research/working\\_papers/rwp03\\_004\\_fountain.pdf](http://www.ksg.harvard.edu/digitalcenter/research/working_papers/rwp03_004_fountain.pdf))
- Garson, G. D., (2003). Toward an information technology research agenda for public administration. In Garson, D.D. (ed.), *Public information technology: policy and management issues*, Hershey,PA: IDEA Publishing Group.
- Gertner, J., (2004). The very, very personal is the political. *New York Times: Sunday Magazine*, February 15: 43.
- Novak, V., Locke, L. A., Hylton, H., Land, G., Morrissey, S., Thigpen, D., & Underwood, J. (2004). The vexations of voting machines. *Time*, 163(18):42-4.
- Schleslinger, R. (2004). "Online strategies still hit and miss for campaigns". *Campaigns & Elections*, 25(9) pg 26-28.
- Stone, R. A. (2004). "The Internet as a Get Out the Vote Tool". *Campaigns & Elections*, 25(8) 35-36.

Shulman, S. W., Schlosberg, D., Zvestoski, S., & Courard-Hauri, D. (2003). Electronic rulemaking: a public participation research agenda for the social sciences. *Social Science Computer Review*, 21, 162 – 178.

Trippi, J. (2004). *The revolution will not be televised: Democracy, the internet, and the overthrow of everything*. New York: Regan Books.

Viguerie, R. A., Franke, D., & LaHaye, T. (2004). *America's right turn: How conservatives used new and alternative media to take power*. Chicago: Bonus Books.

## **Cases Cited**

*Vieth v. Jubelirer* 2004. 541 US 267