

Rules for VoComp 2007

Part A: Evaluation Criteria of Competition Systems

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See Part B for all other VoComp rules, including enactment, guiding principles, eligibility, ethics, schedule, prizes, and judges. For more about VoComp, see www.vocomp.org

1 Overview of VoComp

VoComp comprises a *voting systems competition* and an associated *voting technology conference*. Its goals are to stimulate innovation in voting system technology, to foster interactions among students, researchers, and election officials, and to encourage student involvement in the vital civic process of voting.

During the academic year, student teams will design, implement, and demonstrate voting technology in on-campus elections. Five finalist teams will be invited to the *VoComp Competition Finals*, which will take place July 16–18, 2007, in Portland, Oregon, where there will be presentations and a mock election.

The *VoComp Conference* will also take place at the same time and place, which will feature scholarly papers and presentations and demonstrations. The conference welcomes submissions from anyone on any of the following topics: descriptions and analyses of any competition entry, critiques of any competition entry, descriptions and analyses of other election technology including partial election systems, and metrics for evaluating voting systems. Anyone may submit, including competitors and others. *Any submission describing voting technology must include a working demonstration implementation of the technology.*

[a call for papers will be developed, approved, and posted]

2 Evaluation criteria

The judges will evaluate each competition system entry in three broad areas:

1. Quality of required documentation
2. Technical characteristics of the system (architecture and implementation)
3. Sportsmanship of team

2.1 Quality of Documentation

Each team will be required to provide certain specific documentation about their system, its properties, and their analysis of it. As a general principle, to facilitate evaluations and as an inherently desirable scientific practice, each team must perform and provide their own evaluations. Judges will critically consider and interpret these self-evaluations, and perform their own as they see fit.

Required documentation consists of the following.

1. One-page summary description and claims of system
2. Description of the system at the architectural and system design levels
3. Functional specifications
4. Documented source code meeting the functional specifications
5. Detailed description of election procedures
 - 5.1 voter experience
 - 5.2 procedures for election officials for all phases of an election.
6. Results from on-campus election
 - 6.1 description of experience
 - 6.2 easily-computed metrics
 - 6.2.1 average time per voter
 - 6.2.2 average cost in dollars per vote
 - 6.2.3 list of incidents requiring staff intervention
 - 6.2.4 number of requests by voters for assistance
 - 6.3 self-evaluation of system performance
7. Known issues, bugs, missing parts, failure modes
8. Security analysis
 - 8.1 description of trust assumptions
 - 8.2 security claims
 - 8.3 discussion of the number of conspirators required to cause an incorrect tally
9. Other Claims
10. Self-evaluation of the system's technical characteristics listed in Section 2.2 (scores and narrative)

2.2 Technical Characteristics of System

Judges will score each system on several important characteristics, separately for system architecture, implementation, and documentation. Each score will be a number in the range 1 to 5 (1 = poor, 2 = weak, 3 = fair, 4 = good, 5 = excellent) together with a narrative explaining the rationale of the scores. The characteristics will be the following.

1. Cost
2. Usability and accessibility
 - 2.1 voter usability and ballot casting accuracy
 - 2.2 voter accessibility
3. Ease of administration
4. Reliability against non-malicious threats
5. Functional completeness
6. Security, privacy, and availability
 - 6.1 integrity and verifiability of results
 - 6.2 ballot secrecy
 - 6.3 assured operations (resistance to re-running an election)
7. Overall quality

Thus, each judge will assign to each system a matrix of scores, with the rows of the matrix being the characteristics above, and the columns of the matrix being architecture, implementation, documentation.

[Should we try to agree on a set of weights so that we could objectively compute a composite score? The judges would not be compelled to award first place to the system with the highest score.]

Wherever possible, each team should compute and provide objective metrics and descriptive analyses that measure the above characteristics. For example, teams might consider, among others, each of the following metrics.

1. Cost per vote
2. Time per vote
3. Number of poll workers required
4. Ballot casting accuracy
5. Assistance required by voters
6. Failures/incidents requiring poll worker intervention
7. Number of conspirators needed to cause incorrect tally
8. Voter confidence

2.3 Sportsmanship of Team

Sportsmanship will be evaluated as either acceptable or unacceptable. That is, the judges may disqualify a team for poor sportsmanship, regardless of the scientific quality of their system.

Violations of good sportsmanship include scientific misconduct (*e.g.*, fabrication or falsification of data, plagiarism), violations of the ethical and disclosure requirements of these rules, and improper interference with other teams. For example, no one is permitted to carry out any actual attack on any of the competition systems during any test election or demonstration of VoComp.