The Internet Based Electronic Voting Enabling Open and Fair Election

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Voting is the pillar of modern democracies. However, examination of current voting systems (including E-voting techniques) shows a gap between casting secret ballots and tallying and verifying individual votes. This gap is caused by either disconnection between the vote-casting process and the vote-tallying process, or opaque transition (e.g. due to encryption) from vote- casting to vote-tallying and thus, damages voter assurance, i.e. failing to answer the question: "Will your vote count?" We proposed a groundbreaking   E-voting protocol that fills this gap and provides a fully transparent election. In this new voting system, this transition is seamless, viewable, and verifiable. As a result, the above question can be answered assuredly: "Yes, my vote counts!"

The new E-voting protocol is fundamentally different from all existing voting/E-voting protocols in terms of both concepts and the underlying mechanisms. It consists of three innovative Technical Designs: TD1: universal verifiable voting vector; TD2: forward and backward mutual lock voting; and TD3: in-process verification and enforcement. The new technique is the first fully transparent E-voting protocol which fills the aforementioned gap. The trust is split equally among all tallying authorities who are of conflict-of-interest and will technologically restrain from each other. As a result, the new technique enables open and fair elections, even for minor or weak political parties. It is able to mitigate errors and risk and detect fraud and attacks including collusion, with convincingly high probability $1 - 2^{-(m-log(m))n}$ (n: #voters and $m \geq 2$:#candidates). It removes many existing requirements such as trusted central tallying authorities, tailored hardware or software, and complex cryptographic primitives. In summary, the new e- voting technique delivers voter assurance and can transform the present voting booth based voting and election practice. Besides voting and elections, the new technique can also be adapted to other applications such as student class evaluation, rating and reputation systems.