# Electronic Voting and Security

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# Introduction to eVoting

- In theory this is very simple: n=n++
- In practice, lots of open questions:
  - Who makes the voting machines?
  - How do the voting machines really work?
  - Are there any side effects of using eVoting?
  - Are there any vulnerabilities in the system?
  - Who does eVoting benefit?
  - What about paper trails, transparency, etc?

# History

- eVoting has a long history
- Computer tabulated paper ballots have been used since the 1960s
- In the past 20 years we've seen the rise of Direct Record Electronic (DRE) voting machines where users vote on the machines directly

# The hanging chad...
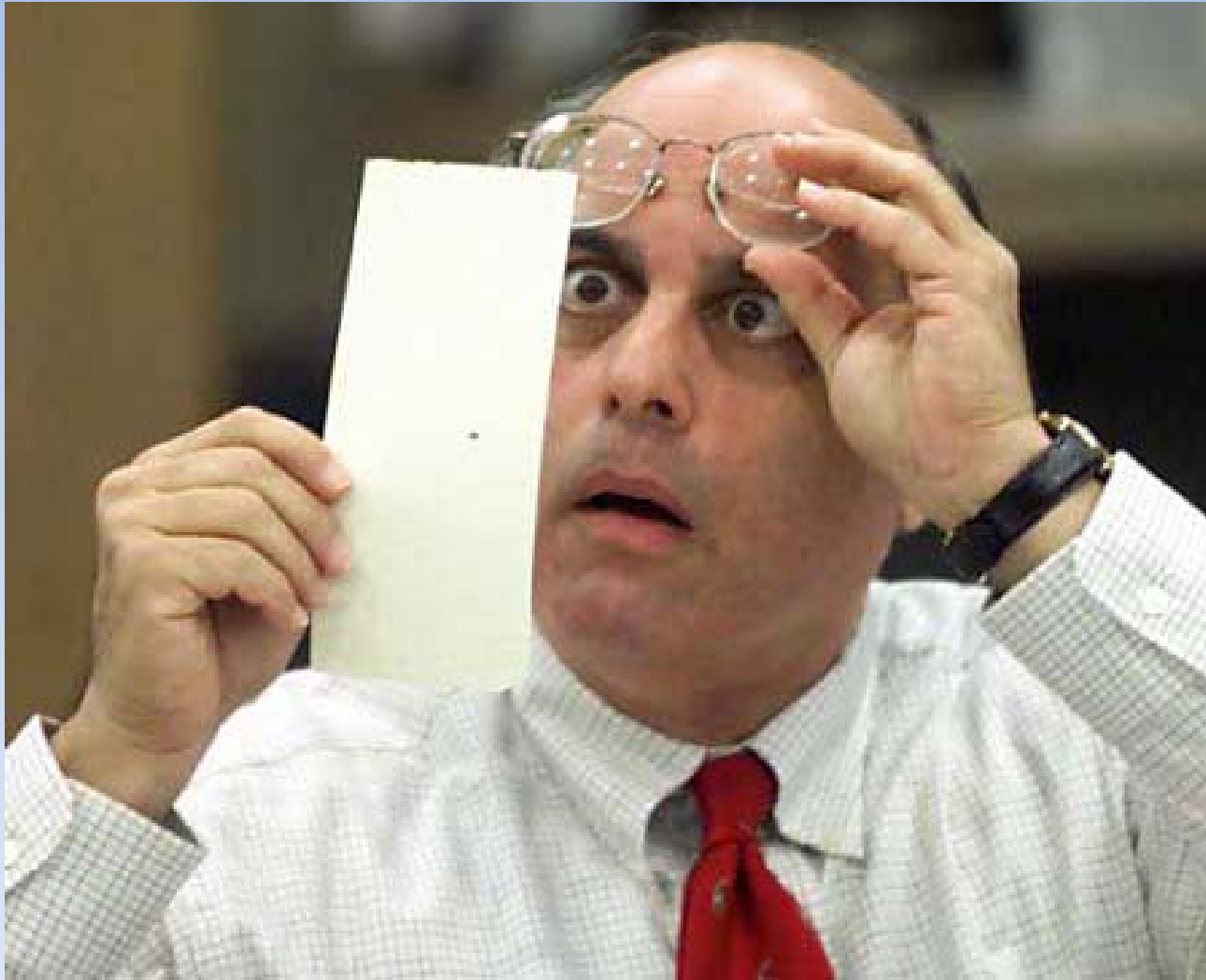
# HAVA

- Help America Vote Act (HAVA) passed – Signed into law October 29, 2002
- Freed several billion in federal budget for states to buy electronic voting equipment…
- Money needed to be spent on a timeline.
- Very loose testing standards on the voting machines.

# Result:

- Voting system manufacturers sold hundreds of millions of dollars worth of machines to states and counties over a short period

- Diebold (later Premier, now a division of ES&S) had the majority market share circa 2005-2006

# Files discovered online…

- In January of 2003, as HAVA money is being spent, an open FTP share is discovered with source code and binaries from Diebold, the current market leader.

- Avi Rubin began to investigate and soon others in the security community were looking at these systems.

VIDEO CLIP

# Supply Chain

- After GEMS, focus shifted to the supply chain...

- The Harri Hursti Hack was discovered.

- Harri asked a simple question: could you tamper with a memory card beforehand to manipulate an election, even after all precautions are taken and all resets done?

  VIDEO CLIP

# Fallout…

- Several large reviews were commissioned:
  - California top to bottom review funded by California Secretary of State
  - EVEREST study funded by Ohio secretary of State
- Conclusion:
  - Most machines reviewed were highly insecure
  - Created a serious problem: no more HAVA money to buy new systems…

# Electronic Voting Today

- A lot more security awareness now at the Secretary of State and Election Supervisor level.

- Some of the same vulnerabilities found in 2004-2008 still exist in some counties today.

- Although some HAVA money is still available, there isn't much of it.

- New legislation has been proposed to make more sweeping changes.