

DREs: Learning from the fields of Human-Computer Interaction & Information Visualization

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Voting and Visualization

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- ◆ The problems of DRE are not unique
 - Typical of public access information systems
 - Need to look to the professionals:
 - Human-Computer Interaction (HCI)
 - Information Visualization (InfoVis)
 - These fields create innovative design/interaction solutions and evaluate this work with qualitative and quantitative user studies.
- ◆ Our goal should be “**better than paper**”



What is paper?

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OFFICIAL SAMPLE BALLOT
GENERAL ELECTION
HIGHLANDS COUNTY, FLORIDA
NOVEMBER 7, 2000

FEDERAL	
ELECTORS FOR PRESIDENT AND VICE PRESIDENT	
(A vote for the candidate here casts a vote for that elector.)	
(Vote for ONE ticket.)	
GEORGE W. BUSH - PRESIDENT	AL GORE - VICE PRESIDENT
DUCK CHENEY - VICE PRESIDENT	JOE LIBERMAN - VICE PRESIDENT
MARTIN RICHMOND - PRESIDENT	ARL CLIVER - VICE PRESIDENT
RALPH ABRAHAM - PRESIDENT	WYNNE LEIGUE - VICE PRESIDENT
JAMES SHARPE - PRESIDENT	MARGARET TROMB - VICE PRESIDENT
JOHN HAGELL - PRESIDENT	MAT GOLDHABER - VICE PRESIDENT
FAY GOODMAN - PRESIDENT	EDOLA FORSTER - VICE PRESIDENT
DAVID BUREY FOLDS - PRESIDENT	MARY CAL HOLLES - VICE PRESIDENT
HOWARD PHILLIPS - PRESIDENT	J. DANIEL FRENZLE - VICE PRESIDENT
MONICA MOONHEAD - PRESIDENT	CLORNA LARSEN - VICE PRESIDENT

CONGRESSIONAL	
UNITED STATES SENATOR	
(Vote for ONE.)	
BILL MCCOLLUM	22
BILL NELSON	23
JOE SIMONETTA	24
JOEL DECHARD	25
WILLIE LOGAN	26
ANDY MARTIN	27
DARRELL L. MCCORMICK	28

To vote for a write-in candidate, follow the directions on the top stub of your ballot card.

REPRESENTATIVE IN CONGRESS, 15th CONGRESSIONAL DISTRICT	
(Vote for ONE.)	
ADAM H. PUTNAM	31
MIKE STEDEM	32

To vote for a write-in candidate, follow the directions on the top stub of your ballot card.

REPRESENTATIVE IN CONGRESS, 16th CONGRESSIONAL DISTRICT	
(Vote for ONE.)	
MARK FOLEY	35
JEAN ELLIOTT BROWN	36
JOHN MCGUIRE	37

To vote for a write-in candidate, follow the directions on the top stub of your ballot card.

STATE	
TREASURER	
(Vote for ONE.)	
TOM GALLAGHER	42
JOHN COGGROVE	43

COMMISSIONER OF EDUCATION	
(Vote for ONE.)	
CHARLE CRIST	45
GEORGE H. SHELDON	46
VASSILIA GAZETAS	47

LEGISLATIVE	
STATE REPRESENTATIVE, 7TH HOUSE DISTRICT	
(Vote for ONE.)	
JOSEPH R. SPATT	49
DORIS GENTRY	50

COUNTY	
CLERK OF THE CIRCUIT COURT	
(Vote for ONE.)	
L. E. "LUKE" BROOKER	52
CHARLES L. LARSEY	53

COUNTY COMMISSIONER	
DISTRICT 3	
(Vote for ONE.)	
ANDREW B. JACKSON	55
J.D. BARRETT	56
TIM K. SCOTT	57

NONPARTISAN JUDICIAL	
JUSTICE OF THE SUPREME COURT	
Shall Justice R. FRED LEWIS of the SUPREME COURT be retained in office?	YES 62 NO 63



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OFFICIAL SAMPLE BALLOT
GENERAL ELECTION
HIGHLANDS COUNTY, FLORIDA
NOVEMBER 7, 2000

JUSTICE OF THE SUPREME COURT	
Shall Justice BARBARA J. PARIENTE of the SUPREME COURT be retained in office?	YES 64 NO 65
Shall Justice PEGGY A. QUINCE of the SUPREME COURT be retained in office?	YES 66 NO 67

NONPARTISAN JUDICIAL	
DISTRICT COURT OF APPEAL	
Shall Judge JOHN R. BLUE of the 2ND DISTRICT COURT OF APPEAL be retained in office?	YES 80 NO 81
Shall Judge DARRYL C. CASANUEVA of the 2ND DISTRICT COURT OF APPEAL be retained in office?	YES 82 NO 83
Shall Judge CHARLES A. DAVIS, JR. of the 2ND DISTRICT COURT OF APPEAL be retained in office?	YES 84 NO 85
Shall Judge OLIVER L. GREEN of the 2ND DISTRICT COURT OF APPEAL be retained in office?	YES 86 NO 87
Shall Judge E.J. SALCINES of the 2ND DISTRICT COURT OF APPEAL be retained in office?	YES 88 NO 89
Shall Judge THOMAS E. STRINGER of the 2ND DISTRICT COURT OF APPEAL be retained in office?	YES 90 NO 91

DISTRICT COURT OF APPEAL	
Shall Judge EDWARD F. THREAGILL of the 2ND DISTRICT COURT OF APPEAL be retained in office?	YES 92 NO 93

PROPOSED CONSTITUTIONAL AMENDMENTS OR OTHER PUBLIC MEASURES	
NO. 1 CONSTITUTIONAL AMENDMENT (INITIATIVE)	
Florida Transportation Initiative for statewide high speed monorail, fixed guideway or magnetic levitation system.	
To reduce traffic and increase travel alternatives, this amendment provides for development of a high speed monorail, fixed guideway or magnetic levitation system linking Florida's five largest urban areas and providing for access to existing air and ground transportation facilities and services by directing the state and/or state authorized private entity to implement the financing, acquisition of right-of-way, design, construction and operation of the system, with construction beginning by November 1, 2003.	
YES FOR APPROVAL	106
NO FOR REJECTION	107
NO. 2 CIRCUIT COURT JUDGE REFERENDUM (IMPLEMENTING ARTICLE V, SECTION 10) Local Option for Selection of Circuit Judges	
Shall the method of selecting circuit court judges in the tenth judicial circuit be changed from election by a vote of the people to selection by the judicial nominating commission and appointment by the Governor with subsequent terms determined by a retention vote of the people?	
YES	122
NO	123

NO. 3 COUNTY COURT JUDGE REFERENDUM (IMPLEMENTING ARTICLE V, SECTION 10) Local Option for Selection of County Judges	
Shall the method of selecting county court judges in Highlands County be changed from election by a vote of the people to selection by the judicial nominating commission and appointment by the Governor with subsequent terms determined by a retention vote of the people?	
YES	128
NO	129



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<p>OFFICIAL SAMPLE BALLOT GENERAL ELECTION HIGHLAND COUNTY, FLORIDA NOVEMBER 1, 2005</p>		<p>*CITY OF AVON PARK CITY COUNCIL (Vote for not more than THREE)</p> <table border="1"> <tr><td>ED DICKERSON</td><td>156</td></tr> <tr><td>DOUG EASON</td><td>157</td></tr> <tr><td>BRENDA J. GRAY</td><td>158</td></tr> <tr><td>STEVE N. HANDLEY</td><td>159</td></tr> <tr><td>ALJIDE HINSON</td><td>160</td></tr> <tr><td>VIVIAN L. WENZIE</td><td>161</td></tr> <tr><td>ERNEST E. WOOD, SR.</td><td>162</td></tr> </table>		ED DICKERSON	156	DOUG EASON	157	BRENDA J. GRAY	158	STEVE N. HANDLEY	159	ALJIDE HINSON	160	VIVIAN L. WENZIE	161	ERNEST E. WOOD, SR.	162	<p>*SPECIAL NOTE: To vote for the Representative in Congress, 12th Congressional District, you must live in precinct 1-2-3-6-16 or 21. To vote for the Representative in Congress, 18th Congressional District, you must live in precinct 4-5-7-8-9-10-11-12-13-14-15-17-18-19-20-22-23 or 24. To vote for State Representative, 77th House District, you must live in precinct 2-4-5-7-8-9-10-11-13-14-15-16-17-19-20-21-23 or 24. To vote in the Town of Lake Placid Charter Amendment Election, you must live inside the Town Limits which includes precincts 13L-17L and 19L. To vote in the Avon Park City Election, you must live inside the City Limits of Avon Park, which includes precincts 1-2 and 6A. All Other races will be voted on Countywide. Please check your voter registration card for your precinct number.</p>	
ED DICKERSON	156																		
DOUG EASON	157																		
BRENDA J. GRAY	158																		
STEVE N. HANDLEY	159																		
ALJIDE HINSON	160																		
VIVIAN L. WENZIE	161																		
ERNEST E. WOOD, SR.	162																		
<p>*TOWN OF LAKE PLACID CHARTER AMENDMENT AMENDMENT TO THE LAKE PLACID TOWN CHARTER SECTION 8A, COMPENSATION AND EXPENSE REIMBURSEMENTS. The proposed Town Charter Amendment discontinues payment of the Mayor's and Councilmember's health insurance, increases the Mayor's monthly compensation from \$150.00 to \$200.00, provides the Vice Mayor a monthly compensation of \$325.00, and increases each Councilmember's monthly compensation from \$100.00 to \$300.00.</p> <table border="1"> <tr><td>YES, FOR THE AMENDMENT</td><td>142</td></tr> <tr><td>NO, AGAINST THE AMENDMENT</td><td>143</td></tr> </table>		YES, FOR THE AMENDMENT	142	NO, AGAINST THE AMENDMENT	143	<p>CITY OF AVON PARK REFERENDUM *ADDITIONAL RESIDENCY REQUIREMENTS FOR CITY COUNCIL CANDIDATES AND MEMBERS* Do you approve amendment of the City Charter of the City of Avon Park, by amending Section 7 to require candidates and members of city council to reside within the city limits and to resign their position within (7) days if they no longer reside in the city.</p> <table border="1"> <tr><td>YES FOR APPROVAL</td><td>168</td></tr> <tr><td>NO FOR REJECTION</td><td>169</td></tr> </table>		YES FOR APPROVAL	168	NO FOR REJECTION	169								
YES, FOR THE AMENDMENT	142																		
NO, AGAINST THE AMENDMENT	143																		
YES FOR APPROVAL	168																		
NO FOR REJECTION	169																		



What are computer interfaces?

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- ♦ Many companies don't advertise the interface
- ♦ When they do, they don't describe usability studies
- ♦ There is no overview
- ♦ Navigation is often a challenge



MicroVote Infinity Voting Panel – next, prev in red



Hart InterCivic eSlate.



VoteHere Platinum.



Information Visualization

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- ◆ Visualization **helps users see patterns and detect outliers in large data sets**
- ◆ A ballot *is a large dataset*
 - Most DREs show less than 4 races per screen
 - How do voters understand how they voted?
 - How do voters build trust in these systems?
- ◆ Show more than fits on the screen by:
 - Good, dense information design
 - Overview+detail
 - Abstracted representations
 - Simple navigation mechanisms



Navigating Large Spaces

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- ◆ Imagine driving from NY to CA with only street maps.
- ◆ You need abstracted overview maps – that show states and highways.
- ◆ We have the same problem with voting systems:
 - How do you get an overview of the state of your ballot?



A Motivating Example

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- ◆ Zoomable User Interface (ZUI)
 - Single screen interface
 - Overview + Detail
 - Natural navigation and progress indication



Follow-up

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- ◆ Where do we go from here?
Learn from the HCI/InfoVis communities:
 - Build designs to support range of tasks:
 - “understanding” tasks
 - Intangibles, including voter comfort and trust
 - Evaluate with representative users
 - Usability studies to find interface errors and understand user satisfaction
 - Quantitative empirical studies to measure performance data: speed & accuracy

