

Dr. Richard T. Carback III

Curriculum Vitae

ITE 228, Cyber Defense Lab
University of Maryland, Baltimore County
Department of Computer Science and Electrical Engineering
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RESEARCH INTERESTS

Computer Security and Cryptographic Systems Engineering. Primary interest in voting systems. Other interests include privacy enhancing technologies, virtual systems security, cryptology, discrete algorithms, and information assurance.

EDUCATION

December 2010 Ph.D. *magna cum laude* in Computer Science, University of Maryland, Baltimore County.

May 2008 M.S. *summa cum laude* in Computer Science, University of Maryland, Baltimore County.

May 2005 B.S. *cum laude* in Computer Science, University of Maryland, Baltimore County.

EMPLOYMENT HISTORY

2010—Present **Adjunct Professor of Computer Science and Electrical Engineering**
Dept. of Computer Science and Electrical Engineering, University of Maryland, Baltimore County

Teach classes.

2007—Present **Research Scientist**
Convergent Technologies, Inc (CTI). Baltimore, MD

Computer security research and development.

Fall
2005—Spring
2009 **Research/Teaching Assistant**
Dept. of Computer Science and Electrical Engineering, University of Maryland, Baltimore County

- Member of the [Cyber Defense Lab \(CDL\)](#).
- Updated, designed, and created [Cyber Defense Exercises \(CDXs\)](#) for use in courses at UMBC.
- Taught lab sections, graded, and assisted students with assignments and projects.

1999—2005

Software Engineer*L-3 Communications Government Services, Inc. Chantilly, VA*

Formally known as EER Systems, located in Seabrook, MD.

- Tactical Automated Security System (TASS) and Integrated Base Defense Security System (IBDSS) Contractor Logistics Support Group: Inventory management database, bar code printing/reading system, external access for Government and Military clients via a secure website, internal access in Java and VB application clients. See: <http://l-3gsi.com/>
- Maintenance Mentoring System (MMS): Worked in programming team on application that automated creation of an interactive set of HTML documents from maintenance manuals. The documents were used on a portable computer to service engines and other heavy military equipment. In a test, the use of the MMS saved 62 minutes out of a total 682 minutes for Stage I F-402-408B engine assembly. See: <http://ctma.ncms.org/Completed%20Projects/MMSII.htm>

2002—2005

System Administrator*The Retriever Weekly Student Newspaper. University of Maryland, Baltimore County*

Along with an assistant and webmaster: managed workstations, door code access, web/e-mail/storage servers, fax machines, and printers. See: <http://retrieverweekly.com/>

TEACHING EXPERIENCE

- CTI. Networking, Operating Systems, Solaris, Linux, C Programming, and Reverse Engineering (contact me for details).
- UMBC. Spring 2011. Wireless Security - Adjunct Instructor.
- UMBC. Spring 2006, 2008, 2009 and Fall 2007, 2008. Principles of Operating Systems - Grading and course project assistance. See: <http://www.cs.umbc.edu/courses/undergraduate/421/spring06/krishna/> (Other course websites unavailable).
- UMBC. Spring 2007. Introduction to Network Security - Grader. See: <http://cisa.umbc.edu/courses/cmssc/487/>
- UMBC. Spring 2007. Research Skills for Computer Science - Grader and writing assistance. See: <http://www.csee.umbc.edu/~krishna/cs601/>
- UMBC. Fall 2006. Information Assurance - Grading and course project assistance.
- UMBC. Fall 2006. Computer Science I for Majors - Taught two hour weekly lab (programming) sections on basics of computer science. See: <http://www.cs.umbc.edu/courses/undergraduate/201/fall06/index.shtml>
- UMBC. Fall 2005. Computer Science II for Majors - Taught six hour weekly lab (programming) sections. Topics included aggregation, operator overloading, dynamic memory, inheritance, polymorphism, exceptions, and templates. See: <http://www.csee.umbc.edu/courses/undergraduate/202/fall05/>

PUBLICATIONS

- **Richard Carback**, David Chaum, Jeremy Clark, John Conway, Aleksander Essex, Paul Herrnson, Travis Mayberry, Stefan Popoveniuc, Ronald Rivest, Emily Shen, Alan Sherman, and Poorvi Vora. "Voter and Poll Worker reactions to Scantegrity at Takoma Park." 2010.

Pending.

- **Richard Carback**. "Engineering Practical End-to-End Election Systems." 2010. UMBC PhD Thesis.
- Stefan Popoveniuc and **Richard Carback**. "ClearVote: An End-to-End Voting System that Distributes Privacy Between Printers." 2010. WPES '10 Proceedings of the 9th annual ACM workshop on Privacy in the electronic society
- **Richard Carback**, David Chaum, Jeremy Clark, John Conway, Aleksander Essex, Paul Herrnson, Travis Mayberry, Stefan Popoveniuc, Ronald Rivest, Emily Shen, Alan Sherman, and Poorvi Vora. "Scantegrity II Municipal Election at Takoma Park: The First E2E Binding Governemental Election with Ballot Privacy." 2010. USENIX Security 2010.
- **Richard Carback**, David Chaum, Jeremy Clark, John Conway, Aleksander Essex, Paul Herrnson, Travis Mayberry, Stefan Popoveniuc, Ronald Rivest, Emily Shen, Alan Sherman, and Poorvi Vora. "Scantegrity Mock Election at Takoma Park." 2010. EVOTECC 2010.
- Stefan Popoveniuc, Jeremy Clark, **Richard Carback**, Aleks Essex, and David Chaum. "Securing Optical Scan Voting." 2010. Towards Trustworthy Elections. LNCS Volume 6000.
- David Chaum, **Richard Carback**, Jeremy Clark, Aleksander Essex, Stefan Popoveniuc, Ronald Rivest, Peter Ryan, Emily Shen, Alan Sherman, and Poorvi Vora. "Scantegrity: End-to-End Verifiability for Optical Scan Elections." 2009. IEEE Transactions on Information Forensics and Security: Special Issue on Voting.
- Russel Fink, Alan Sherman, and **Richard Carback**. "TPM Meets DRE: Reducing the Trust Base for Electronic Voting Using Trusted Platform Modules." 2009. IEEE Transactions on Information Forensics and Security: Special Issue on Voting.
- Alan Sherman, **Richard Carback**, David Chaum, Jeremy Clark, John Conway, Aleksander Essex, Paul Herrnson, Travis Mayberry, Stefan Popoveniuc, Ronald Rivest, Anne Sergeant, Emily Shen, Bimal Sinha, and Poorvi Vora. "Scantegrity Mock Election at Takoma Park (summary)." 2009. NIST 2009 Workshop on E2E Voting Systems.
- David Chaum, **Richard Carback**, Jeremy Clark, Aleksander Essex, Stefan Popoveniuc, Ronald L. Rivest, Peter Y.A. Ryan, Emily Shen, and Alan T. Sherman. "Scantegrity II: End-to-End Verifiability For Optical Scan Election Systems Using Invisible Ink Confirmation Codes" 2008. EVT'08: Proceedings of the conference on Electronic voting technology.
- David Chaum, Aleksander Essex, **Richard Carback**, Jeremy Clark, Stefan Popoveniuc, Alan T. Sherman, and Poorvi L. Vora. "Scantegrity: End-to-end voter-verifiable optical-scan voting." 2008. IEEE Security & Privacy.
- **Richard Carback**. "Security Innovations in the Punchscan Voting System" 2008. Masters Thesis, UMBC.
- **Richard Carback**, Jeremy Clark, Aleks Essex, and Stefan Popoveniuc. "On the Independent Verification of a Punchscan Election." 2007. In Online Proceedings of the 2007 University Voting Systems Competition (VoComp 2007).
- Aleks Essex, Jeremy Clark, **Richard Carback**, Jeremy Clark, Aleks Essex, and Stefan Popoveniuc. "The Punchscan Voting System: VoComp Submission Document." 2007. In Online Proceedings of the 2007 University Voting Systems Competition (VoComp 2007).
- **Richard Carback**, Stefan Popoveniuc, Alan T. Sherman, and David Chaum. "Punchscan with Independent Ballot Sheets: Simplifying Ballot Printing and Distribution with Independently Selected Ballot Halves." 2007. In Preproceedings of the 2007 IAVoSS Workshop on Trustworthy Elections (WOTE 2007).
- Aleks Essex, Jeremy Clark, **Richard Carback**, and Stefan Popoveniuc. "Punchscan in Practice: An E2E Election Case Study." 2007. In Preproceedings of the 2007 IAVoSS Workshop on Trustworthy Elections (WOTE 2007).
- Kevin Fisher, **Richard Carback**, and Alan T. Sherman. "Punchscan: Introduction and System Definition of a High-Integrity Election System." 2006, In Preproceedings of the 2006 IAVoSS Workshop on Trustworthy Elections (WOTE 2006).

Manuscripts and updated list available at <http://carback.us/rick/research.php>

TALKS

- Richard Carback. "ClearVote: An End-to-End Voting System that Distributes Privacy Between Printers." WPES '10 Proceedings of the 9th annual ACM workshop on Privacy in the electronic society. 2010.
- Richard Carback. "Scantegrity II Municipal Election at Takoma Park: The First E2E Binding Governmental Election with Ballot Privacy." USENIX Security 2010.
- Richard Carback. "Scantegrity II: Vote Confirmation and Digital Audit Trails." Takoma Park Maryland Board of Elections. April 2008.
- Aleks Essex, Richard Carback. "Scantegrity II: Vote confirmation for Optical Scan Machines." Ottawa Canadian Linux User's Group Meeting. April 2008.
- Richard Carback. "Cyber Defense Lab and Electronic Voting Security." UMBC First Year Seminar Course for Computer Science Students. March 2008.
- David Chaum, Aleks Essex, Jeremy Clark, Richard Carback, Stefan Popoveniuc. "Scantegrity II: Vote Confirmation for OpScan." ITIF Forum: The Future of Voting. March 2008.
- Richard Carback. "Voting Security." UMBC First Year Seminar Course for Computer Science Students. February 2007 and November 2007.
- Stefan Popoveniuc and Richard T. Carback. "Punchscan." Harvard University's Privacy and Security Lunch Seminar. November 2006.
- Richard T. Carback, David Chaum, Jeremy Clark, Aleks Essex, Kevin Fisher, Ben Hosp, Stefan Popoveniuc, Jeremy Robin. "Punchscan and VoComp." Rump Session of CRYPTO 2006.

POSTERS

- Richard Carback. "Scantegrity: See Your Vote Count—Voting with Confirmation Numbers and Verification Codes." UMBC CSEE Research Day. May 2008.
- Richard Carback. "Creating and Sharing a Secret from Passphrases Without a Trusted Dealer." UMBC CSEE Research Day. May 2007.
- Richard Carback, Kevin Fisher, and Sandi Lwin. "The PunchScan Voting System: Refinement and System Design." UMBC CSEE Research Day. May 2006.

PROFESSIONAL SERVICE

- Founding Board Member. Voting Systems Institute. 2010.
- Administrative Editor. LNCS Volume 6000. Towards Trustworthy Elections. 2008—2010.
- Reviewer. Cryptologia. 2007.

HONORS

- VoComp 2007 1st place prize winner for Punchscan voting system. See: <http://vocomp.org/>
- UMBC Outstanding Student Alumni Award 2005

AFFILIATIONS

- Voting Systems Institute (2010)
- Scantegrity Research Group (2007)
- Punchscan Research Group (2005—2008)
- UMBC Cyber Defense Lab (2005—2010)
- UMBC Center for Information Security and Assurance (2005—2010)
- Triangle Fraternity of UMBC (2002)