

# Italo Dacosta

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## Research Interests

My current research focuses on the analysis, design, optimization and evaluation of network security protocols for large-scale Internet systems such as Web and VoIP applications. I am also interested in identity management, web security, privacy preserving technologies and mobile security.

## Education

- **Ph.D. Candidate, Computer Science** 2007 - 2012 (expected)  
**Georgia Institute of Technology**, Atlanta, GA, USA  
Dissertation Title: *Practical Authentication in Large-Scale Internet Applications*  
Advisers: Prof. Mustaque Ahamad and Prof. Patrick Traynor  
GPA: 3.93/4.0
- **M.S. Information Security and Graduate Certificate in Management of Technology** 2007  
**Georgia Institute of Technology**, Atlanta, GA, USA  
Fulbright scholar  
Adviser: Prof. Mustaque Ahamad  
GPA: 3.89/4.0
- **B.E. Electronic and Communication Engineering** 2002  
**Universidad de Panama**, Panama City, Panama  
Thesis title: *Use of Cryptographic Tokens to Store Private Keys in a Public Key Infrastructure*  
GPA: 3.8/4.0

## Publications

### *In Submission:*

- Italo Dacosta, Mustaque Ahamad and Patrick Traynor, *Trust No One Else: Detecting MITM Attacks Against SSL/TLS Without Third-Parties*, European Symposium on Research in Computer Security (ESORICS).
- Henry Carter, Chaitrali Amrutkar, Italo Dacosta, and Patrick Traynor, *For Your Phone Only: Custom Protocols for Efficient Secure Function Evaluation on Mobile Devices*, European Symposium on Research in Computer Security (ESORICS).

### *Published:*

- Italo Dacosta, Saurabh Chakradeo, Mustaque Ahamad and Patrick Traynor, *One-Time Cookies: Preventing Session Hijacking Attacks with Disposable Credentials*, ACM Transactions on Internet Technology (TOIT), in press.

- Nilesh Nipane, Italo Dacosta and Patrick Traynor, “*Mix-In-Place*” *Anonymous Networking Using Secure Function Evaluation*, Proceedings of the Annual Computer Security Applications Conference (ACSAC), December 2011.
- Italo Dacosta, Vijay Balasubramaniyan, Mustaque Ahamad and Patrick Traynor, *Improving Authentication Performance of Distributed SIP Proxies*, IEEE Transactions on Parallel and Distributed Systems (TPDS), vol.22, no.11, pp.1804-1812, November 2011
- Italo Dacosta, *HTTP Digest Authentication*, Encyclopedia of Cryptography and Security, Springer, pp.565-567, 2011, Editors: Henk C. A. van Tilborg and Sushil Jajodia.
- Italo Dacosta and Patrick Traynor, *Proxychain: Developing a Robust and Efficient Authentication Infrastructure for Carrier-Scale VoIP Networks*, USENIX Annual Technical Conference (ATC), June 2010.
- Italo Dacosta, Vijay Balasubramaniyan, Mustaque Ahamad and Patrick Traynor, *Improving Authentication Performance of Distributed SIP Proxies*, Conference on Principles, Systems and Applications of IP Telecommunications (IPTComm), July 2009.
- Italo Dacosta, Neel Mehta, Evan Metrock, and Jonathon Giffin, *Security analysis of an IP phone: Cisco 7960G*, Conference on Principles, Systems and Applications of IP Telecommunications (IPTComm), July 2008.
- Vijay Balasubramaniyan, Arup Acharya, Mustaque Ahamad, Mudhakar Srivatsa, Italo Dacosta and Charles Wright, *SERvartuka: Dynamic Distribution of State to Improve SIP Server Scalability*, 28th IEEE International Conference on Distributed Computing Systems (ICDCS), June 2008.

## Research and Professional Experience

- **Georgia Institute of Technology**, Atlanta, GA, USA [2007 – present]  
Graduate Research Assistant
  - Designed and implemented a robust, efficient and easy to deploy mechanism to improve the authentication of web servers and prevent MITM attacks against SSL/TLS.
  - Designed and implemented a web session authentication protocol that preserves the performance and scalability benefits of HTTP cookies while providing stronger security guarantees (e.g., prevention of session hijacking attacks).
  - Developed and evaluated a protocol based on Secure Function Evaluation (SFE) that provides stronger anonymity guarantees than traditional mix-networks and executes 98% faster than naïve implementations.
  - Implemented privacy enhancing mechanisms based on SFE and partially homomorphic cryptosystems in mobile platforms (e.g., Android OS).
  - Designed and implemented a novel VoIP SIP authentication protocol that allows an improvement of greater than 1,700% of the maximum call throughput possible with Digest authentication.
  - Analyzed performance impact of Digest authentication on a distributed VoIP SIP infrastructure and developed a mechanism to improve authenticated signaling throughput by more than 75%.
  - Performed security analysis of Cisco IP phone resulting on the discovery of highly critical vulnerabilities (Cisco Advisory ID: cisco-sa-20080213-phone).
- **INRIA-LORIA**, Nancy, France [Summer 2010]  
Research Intern
  - Performed research on automatic vulnerability assessment of Flash applications using fuzzing techniques.

- **Star Contact** (international call center), Panama City, Panama [Summer 2007]  
Information Security Consultant
  - Conducted comprehensive network security audit resulting in a report for PCI compliance.
  - Proposed and implemented changes to the security architecture of the company's network.
- **BLADEX** (supranational bank), Panama City, Panama [2002 – 2005]  
Information Security Officer
  - Managed penetration tests and vulnerability assessment projects.
  - Performed the security evaluation of new software systems adopted by the bank.
  - Established and led the bank incident response team.
  - Implemented and managed distributed Firewall IDS and antivirus system.
- **E-Business Investments** (startup company), Panama City, Panama [2000 – 2001]  
Network and Security Administrator
  - Designed, implemented and managed the security architecture of the first electronic commerce web site in Panama.
- **Secretary of Science, Technology and Innovation**, Panama City, Panama [1998 – 2000]  
Research Intern
  - Collaborated on the implementation and management of the first public key infrastructure in Panama.

## Awards and Honors

- Student Travel Awards: ACSAC 2011, USENIX ATC 2010 and USENIX Security 2009 and 2011.
- Tower Award for outstanding academic achievement at Georgia Institute of Technology, 2007.
- Fulbright Scholarship for Master's degree program, 2005-2007.

## Teaching Experience

- Lecturer for two graduate-level courses (Advanced Internet Applications and Network Security), Universidad de Panama, Panama, Spring and Summer 2011.
- Guest lecturer for the graduate-level Secure Computing Systems course (CS6238), Georgia Institute of Technology, Spring 2012.
- Guest lecturer for the graduate-level Network Security course (CS6262), Georgia Institute of Technology, Fall 2011.

## Skills

- Programming: C, Python, Java, PHP, JavaScript and Bash shell scripts.
- Operating systems: Linux, Mac OS X, Windows and Android.
- Security tools: network and vulnerability scanners, network sniffers, fuzzers, IDSs and Firewalls.
- Languages: Spanish (native), English (proficient).

## Professional Service

- Reviewer for the Georgia Institute of Technology Presidents Undergraduate Research Awards (PURA), 2012.
- External reviewer for TPDS (2010, 2011), NDSS (2010), ACSAC(2009) and ICISS (2009).
- USENIX ;Login: Magazine session summaries (USENIX Security 2009 and 2011 and USENIX ATC 2010).
- Note-taker for the Global DNS Security, Stability, and Resiliency Symposium, Atlanta, GA, USA, 2009.
- Student member of IEEE and IEEE Computer Society (1999 - present), ACM (2007 - present) and USENIX (2009 - present).

## References

- Dr. Mustaque Ahamad      Professor, Georgia Institute of Technology, College of Computing  
Director of Georgia Institute of Technology Information Security Center  
Tel: +1 (404) 894-2593  
Email: [mustaq@cc.gatech.edu](mailto:mustaq@cc.gatech.edu)
- Dr. Patrick Traynor      Assistant Professor, Georgia Institute of Technology, College of Computing  
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