

# Victor Marius Costan ( 龍望 / 龙望 )

victor@costan.us

www.costan.us

+1 (646) 434-8887

## Education

- 
- 2009 – Present : Massachusetts Institute of Technology, Ph.D.** **Cambridge, MA**  
Ph.D. in Computer Science, expected 06/2014  
GPA: 4.9 / 5.0  
Research direction: Security in Distributed Computer Systems, Secure Computer Architectures
- 2007 – 2008 : Massachusetts Institute of Technology, M.Eng.** **Cambridge, MA**  
Master of Engineering in Computer Science, received 06/2008  
GPA: 5.0 / 5.0  
Thesis: *A Commodity Trusted Computing Module* – a high-level specification for a low-cost secure chip offering trusted execution (integrity and privacy) of procedures originating from un-trusted parties.
- 2003 – 2007 : Massachusetts Institute of Technology, B.S. (double major)** **Cambridge, MA**  
B.S. in Computer of Science, B.S. in Management Science, received 06 / 2007  
GPA: 4.9 / 5.0
- 

## Research

- 09/2009 – Present : MIT Computer Science and AI Lab, Research Assistant**  
Investigating trusted computing with commodity CPUs, in the context of Intel's Software Guard Extensions (SGX). Previously researched a practical application of taint tracking in the context of Ruby on Rails applications, and a trusted computing architecture that combined a smartcard-class chip (low performance, NVRAM) with a CPU-class chip (high performance, only volatile memory). Designed FPGA proof of concept and directed fellow PhD student who implemented it.
- 02/2007 – 06/2008 : MIT Computer Science and AI Lab, Research Assistant**  
Researched the design of a successor to the TPM chip. Delivered design, fully functional JavaCard chip prototype, drivers, demo applications. Published results in two papers. Developed Ruby extension for PC/SC smartcards on Windows, Mac OSX, and Linux. Open sourced prototype code.
- 02/2004 – 11/2004 : MIT Computer Science Lab, Undergraduate Researcher**  
Integrated research project (editor leveraging structure recognition in text) into Eclipse via a plug-in.
- 

## Teaching

- 09/2011 – 12/2011 : MIT, Teaching Assistant for Introduction to Algorithms (6.006)**  
Taught recitations for 40 students. Recorded while teaching, videos available on MIT OpenCourseWare. Developed and helped grade homework assignments and exam problems. Held office hours and exam review sessions. Received extremely good (anonymous) student evaluations.
- 06/2010 – 02/2011 : MIT, CEO of IAP Web Programming Competition (6.470)**  
Revamped curriculum to make course more accessible. Developed new materials on HTTP concepts, git, deployment, HTML5 and CSS3. Lectured for 8.5 hours. Recruited staff of 7 student volunteers, ran staff meetings. Promoted course aggressively. Enrolled 165 students, a 100% increase over previous year.
- 02/2010 – 06/2010 : MIT, Teaching Assistant for Intro to Network Security (6.854)**  
Developed and graded homework and quizzes. Held office hours and review sessions. Delivered lecture on security in Web applications. Revamped own web app for homework collection and grading.
- 01/2010 – 02/2010 : MIT, Lecturer for IAP Web Programming Competition (6.470)**  
Developed supporting material and taught lectures on HTML, CSS, JavaScript, Ruby on Rails, security in Web applications. Open-sourced lecture slides based on S5. Designed and ran Facebook ad campaign.
- 04/2009 – 07/2009 : Google University, Instructor**  
Trained to deliver 4-hour introduction on Web technologies (HTML, CSS, JavaScript), to satisfy huge demand in the NYC office. Taught course 4 times and helped train an additional instructor.
- 02/2008 – 06/2008 : MIT, Teaching Assistant for Introduction to Algorithms (6.006)**  
Held recitations for 40 students. Helped create and grade exams and homework. Coded and deployed Ruby on Rails web app used by 80 students and 5 administrators. Keynote presentations published on MIT's OpenCourseWare. Received very good (anonymous) student evaluations.

---

## Pubs

Yang, H.J., Costan, V., Zeldovich, N. and Devadas, S.: *Authenticated storage using small trusted hardware*. ACM Cloud Computing Security Workshop (CCSW) 2013  
Costan, V. and Devadas, S.: *Security Challenges and Opportunities in Adaptive and Reconfigurable Hardware*. Hardware-Oriented Security and Trust (HOST) 2011  
Costan, V., Sarmenta, L., van Dijk, M. and Devadas, S.: *The Trusted Execution Module: Commodity General-Purpose Trusted Computing*. Smart Card Research and Advanced Applications (CARDIS) 2008

---

## Work Experience

**06/2012 – 08/2012 : Dropbox Inc., Software Engineer Intern** **San Francisco, CA**

Helped design and build the Javascript SDK for the Datastores API that launched at the DBX developers conference. Maintained dropbox.js (Javascript SDK that I created the previous summer). Added OAuth 2.0 support to SDK, fixed server-side issues and helped minimize migration pains. Extended CORS support to API endpoint implemented in C++. Drafted strategy for interacting with SDK users via GitHub.

**06/2012 – 08/2012 : Dropbox Inc., Software Engineer Intern** **San Francisco, CA**

Proposed and built dropbox.js Javascript library for the Dropbox API. Open-sourced on github, posted on company blog, released node.js package. Proposed and integrated front-end productivity boosts e.g., jQuery, official SCSS compiler. Helped implement web UI and backend of Dropbox for Teams features.

**07/2008 – 07/2009 : Google Inc, Software Engineer**

**New York, NY**

Developed tools and metrics to evaluate the quality of local business search results, and to help iterate on algorithms that promise to improve local search quality. Previously worked in a team of 5 responsible for local business search quality, optimizing and fine-tuning current search algorithms.

**06/2007 – 09/2007 : Google Inc, Associate Product Manager Intern**

**New York, NY**

Managed cross-functional team to launch AdWords features. Analyzed competition, proposed signals for ethically improving ad targeting. Identified under-performing regions and verticals for local ads.

**11/2004 – 05/2007 : MIT, Lead Software Developer**

**Cambridge, MA**

Developed two multi-player educational games for Palm and Windows Mobile. Built game engines abstracting systems issues (P2P networks, transactions, multi-threading). Led teams of 3-5 students.

**06/2006 – 09/2006 : Apple Inc, Software Engineer Intern**

**Cupertino, CA**

Designed better network diagnostics and configuration via UPnP. Developed UPnP client library, and network status prototype with Cocoa UI. Wrote feature, design and testing specifications.

**06/2005 – 09/2005 : Microsoft Corp, Software Engineer Intern**

**Redmond, WA**

Annotated NFS source code for static analysis tool, fixed revealed security bugs. Wrote NFS installation manifests. Wrote and tested IPv6 support code. Delivered private Windows build for QA.

---

## Awards

**Ship it** in Dropbox hack week August 2013, for building and getting a TBA feature into production

**Best team effort** in Dropbox hack week July 2012, dropbox.js and applications

**1<sup>st</sup> prize** at Google Chrome hackathon in Cambridge, MA, for the Clutter Chrome plug-in

**10<sup>th</sup> place** in 6.370 (MIT Battlecode AI Competition), on team of 6.470 staff members

**Department Special Recognition Award** for contributions to 6.006 (Introduction to Algorithms) as a TA

**2<sup>nd</sup> Place** in 6.470 (MIT Web Programming Competition), Facebook app on watching movies w/ friends

**Best Marketing Plan** in 15.812 (MIT Marketing Management Course)

**Project Prize** in 6.001 (MIT Structure and Interpretation of Computer Programs)

**Best Software Development** in 6.170 (MIT Laboratory in Software Engineering)

**ACM ICPC World Finals** (MIT's team): North American Champions 2004, 5<sup>th</sup> place overall

**International Olympiad of Informatics**: Gold Medal 2003, Silver Medal 2002

**Central European Olympiad of Informatics**: Gold Medal 2002, Silver Medal 2003, Bronze Medal 2001

**Balkan Olympiad of Informatics**: Gold Medal 2001

---

## Personal Projects

- 2013-2014 : Browser Development** – Contributed to WebKit, Blink, Chromium and WebRTC, mostly around standard compliance in DOM, XHR and the File API. Became Chromium committer in 2014.
- 2011 : Google Chrome Plug-In** – Split browser window into multiple frames, for side-by-side browsing in ChromeOS. Co-developed with MIT PhD student. Published in Chrome market, rated 4.5 / 5 stars.
- 2010 : Language Exchange Site** – Language exchange Web app combining instant messaging with flash cards. Innovative UI highlighting words unknown by chat partner. Led team of 4 to develop the initial version in 48 hours for Rails Rumble 2010. Used Ruby on Rails and jQuery.
- 2010 : Git Hosting Site** – Rails-based web app for setting up Git repository hosting and collaboration. Useful subset of GitHub features and few requirements. Open-sourced on github.com
- 2009 : iPhone App** – Stock trading simulation game using real prices. Developed iPhone app, lead 2 MIT alumni for product design and Rails backend. Approved in iTunes Store. Open-sourced reusable code.
- 2008 : Facebook App** – Ruby on Rails app providing assistance with planning social events. Contributed to open-source Rails plug-in facebooker. Led 4 MIT students/alumni in fbFund contest.
- 2008 : Ruby on Rails Deployment** – Ruby gem configures Debian / Ubuntu systems as single-server Ruby on Rails production environments, deploys and manages apps. Open-sourced on github.com
- 2006 : Xbox = Cheap Computer** – Gentoo Linux on Xbox console. Streamed movies on dorm TV. Apache web server, hosting forums for 6.003 (MIT's Signals and Circuits) and bug tracker for research project.
- 2004 : Elegant Code Injection** – framework for stealth, arbitrary C++ code injection in Windows executables; demonstrated by reverse engineering authentication protocol of popular MMORPG game
- 2002 : Automated Evaluation System for Software Contests** – Web UI for problem publishing, solution scoring and contestant ranking. Accurate live rankings by parallelizing scoring on multiple computers.
- 2000 : Operating System Kernel** – C++ on IA-32. Features paging, preemptive multi-tasking, kernel/user modes, dynamic memory allocator, debugger, pluggable and object-oriented file-systems and drivers.
- 1999 : Java Virtual Machine Implementation** – spec-compliant, portable by only using ANSI C calls.

---

## Open Source

Developed general ability to understand all levels of the Web platform and contribute features and bug fixes to open-source projects at all levels of the technology stack.

**Chromium, Blink** – Committer, contributions mostly centered around standards compliance in DOM, XMLHttpRequest and the File API

**WebKit** – ported standards compliance fixes contributed to Blink

**Ruby on Rails** – fixed ActiveRecord bugs

**node.js** - fixed crypto bug

**Rubinius** – implemented IO#ioctl

Ruby gems – bug fixes in bundler, homebrew, jeweler, mechanize, middleman, sass, thin

npm packages – bug fixes in codo, mocha, open, sinon