

# NICOLAS VIENNOT

nicolas@viennot.com – New York, NY

## EDUCATION

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- Columbia University** – *Ph.D. in Computer Science* – New York, NY 2010 – 2016
- Advisor: Jason Nieh.
  - Thesis: Deterministic, Mutable, and Distributed Record-Replay for Operating Systems and Database Systems
- Columbia University** – *M.S. in Computer Science* – New York, NY 2007 – 2009
- Focus areas: Operating Systems, Security, Networking, Programming Languages.
  - GPA: 4.07/4.00
- Supélec** – *Engineering Degree* – Paris, France 2005 – 2007
- Supélec is a top-ranked *Grande École* in France.
  - Focus areas: Computer Science, Signal Processing, Electronic, Power Engineering, and Economics.

## WORK EXPERIENCE

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- Two Sigma** – *Systems Researcher* – New York, NY Dec. 2016 – Present
- In progress.
- Sai Maa** – *CTO* – New York, NY Aug. 2016 – Nov. 2016
- Implemented communication tools, inventory system, event planning software.
- Crowdtap** – *System Engineer* – New York, NY 2012 – 2013
- Implemented Synapse at Crowdtap, a startup with over 500,000 users. Synapse interconnects dozen of their services.
  - Synapse lets independent services cleanly share data with each other with an easy-to-use publish/subscribe API.
  - Synapse transparently synchronizes heterogeneous databases with causal consistency semantics in a scalable manner.
- ASDLabs** – *Full Stack Developer* – New York, NY 2009 – 2010
- Involved in dozens of projects, primarily in the health-care and financial industries. Tasks included business analysis, project planning, application design and development. Often brought creative solutions to the table to cut costs.
  - Dramatically improved internal company processes by training employees to leverage project management tools including centralized file sharing and source revision control systems.
- Columbia University** – *Teaching Assistant* – New York, NY Fall 2009
- Lead Teaching Assistant in Prof. Jason Nieh's notoriously rigorous Operating System class (70 students).
  - Responsible for creating homework assignments, creating scoring rubrics, grading, individual demos, managing repositories for students, and answering questions on an online board (posted more than 1000 messages during the semester).
- EDIMS** – *Developer* – New York, NY Summer 2006
- Fixed memory leaks in the main product (2.5M lines of code) resulting in no longer having to reboot computers daily in hospitals. These leaks were discovered in 3 days. Previously hired contractors were unable to find them in 3 months.
  - Developed a patient chart editor for emergency rooms in hospitals.
- VIBI Prod.** – *Hardware and Software Engineer* – Bordeaux, France Winter 2004
- Designed a radio interface for a USB tablet hidden in a clipboard to be used by professional magicians.
  - The main difficulty was to reverse engineer the tablet drivers to understand its proprietary tablet protocol.
- Elegens Inc.** – *Hardware and Software Engineer* – Mountain View, CA Summer 2003
- Designed the software stack in C++ and C#. It controls a 5-axis robot, a bar-code reader, and a servomotor to select microscope lenses. It detects hundreds of petri dishes and places them under the microscope to capture micro-organisms.
  - Designed a custom electronic board to connect the different hardware components.

## PERSONAL AND RESEARCH PROJECTS

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- tmate.io** – *Instant Terminal Sharing* – <http://tmate.io/> 2013 – Present
- tmate is a tmux fork (terminal multiplexer) coded in C. It allows to share terminals very easily and securely. tmate is mostly used for pair-programming. More than a thousand paired sessions are seen each week.
  - tmate is sponsored by DigitalOcean and deployed on 6 different geographic locations for optimal latency.

- NoBrainer** – *Ruby ORM for RethinkDB* – <http://nobrainer.io/> 2012 – Present
- After too many frustrating experiences with ActiveRecord or Mongoid due to inconsistent APIs and weak semantics, I decided to make my own ORM (Object Relational Mapper). The design goal is to allow quick application prototyping, while providing a rock-solid production experience. API design is one of the most difficult aspect of the project.
- PlayDrone** – *Google Play Crawler* – <https://github.com/nviennot/playdrone> 2012 – 2014
- PlayDrone is the first scalable Google Play crawler. We used it to analyze the source code of over 1.1M applications.
  - We discovered numerous OAuth credential leaks. We collaborated with Facebook, Google and Amazon to mitigate the issues, making the Google Play store a safer place.
  - PlayDrone was used at archive.org to provide a full dump of the Google Play store for other researchers.
- Scribe** – *Deterministic Record-Replay Engine* – <https://github.com/nviennot/linux-2.6-scribe> 2008 – 2012
- Scribe is a transparent, deterministic application execution record-replay mechanism operating at the kernel level.
  - We used Scribe to build RacePro and Dora. Racepro is a system for detecting harmful process races in deployed systems. Dora is a mutable replay engine which enables reproducing non-deterministic bugs with retroactive debugging.

## AWARDS AND PATENTS

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- Kenneth C. Sevcik Outstanding Student Paper Award for “A Measurement Study of Google Play” (SIGMETRICS ’14).
- US Patent 8402318: Systems and methods for recording and replaying application execution.

## SELECTED PUBLICATIONS

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1. **Synapse: A Microservices Architecture for Heterogeneous-Database Web Applications**  
Nicolas Viennot, Mathias Lécuyer, Jonathan Bell, Roxana Geambasu, Jason Nieh, *Proceedings of the 10th European Conference on Computer Systems (EuroSys ’15)*, Bordeaux, France, April 2015.  
Synapse was also presented at RubyConf’13, Miami, FL, Nov. 2013.
2. **A Measurement Study of Google Play**  
Nicolas Viennot, Edward Garcia, and Jason Nieh, *Proceedings of the 2014 ACM International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS ’14)*, Austin, TX, June 2014. (Kenneth C. Sevcik Outstanding Student Paper Award.)
3. **Transparent Mutable Replay for Multicore Debugging and Patch Validation**  
Nicolas Viennot, Sid Nair, and Jason Nieh, *Proceedings of the 18th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS ’13)*, Houston, TX, March 2013.
4. **Pervasive Detection of Process Races in Deployed Systems**  
Oren Laadan, Nicolas Viennot, Chia-Che Tsai, Chris Blinn, Junfeng Yang, and Jason Nieh, *Proceedings of the 23rd ACM Symposium on Operating Systems Principles (SOSP ’11)*, Cascais, Portugal, October 2011.
5. **Transparent, Lightweight Application Execution Replay on Commodity Multiprocessor Operating Systems**  
Oren Laadan, Nicolas Viennot, Jason Nieh, *Proceedings of the 2010 ACM International Conference on Measurement and Modeling of Computer Systems (SIGMETRICS ’10)*, New York, NY, June 2010.
6. **ASSURE: Automatic Software Self-healing Using REscue points**  
Stelios Sidiroglou, Oren Laadan, Carlos Perez, Nicolas Viennot, Jason Nieh, Angelos D. Keromytis, *Proceedings of the 14th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS ’09)*, Washington, DC, March 2009.

## SKILLS

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- Strongest programming languages: Ruby, C, JavaScript, HTML/CSS, x86 assembly. (GitHub: <https://github.com/nviennot>)
- Hobbies: Photography with a focus on headshot and street photography.
- Native French speaker, fluent in English.