

FRANCISCO MATIAS CUENCA-ACUNA

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PROFILE

Over twenty years of experience providing infrastructural software solutions. Unusual combination of skills including scientific, technical and business acumen. Experience participating and coordinating multidisciplinary teams. Interests on Distributed Systems, Security, Internet Servers, Modeling and Data Analysis.

EDUCATION

Ph.D. in Computer Science, Rutgers University, New Brunswick NJ, April 2004

M.S. in Computer Science, Rutgers University, New Brunswick NJ, May 2001

B.S. in Computer Science, FAMA-UNC, Argentina, March 1999

PROFESSIONAL & ACADEMIC EXPERIENCE

Intel, Cordoba, Argentina

Principal Engineer, Security Analytics, 2015 – Present

Solutions Architect, Security Management, 2014 – 2015

Platform Architect, Intel Update Manager, 2008 – 2013

Software Architect & Technical Lead, 2006 – 2008

- Due to the competitive nature of the software industry, I cannot disclose work details here. To obtain a complete resume please email me.

FAMAF – Universidad Nacional de Cordoba, Cordoba, Argentina

Assistant Professor, 2004 – 2008

Ask Jeeves Inc., New Jersey, USA

Systems Architect & Technical Lead, 2005 – 2006

Research Engineer, 2004 – 2005

Ask Jeeves is the third most visited search engine globally (Morgan Stanley 2006), serving 4 billion queries per month and reaching over 25% of the active US Internet audience. Upon my arrival I worked on how to expand their multi-billion document index. One year after, I became the architect and technical leader of a major software redesign project. My current role involves coordinating the work of over 20 developers located in California, New Jersey and China.

Highlights:

- Designed the new offline system architecture for continuous url scheduling, crawling & data processing. This project represents a multimillion dollar investment which is scheduled to replace the existing infrastructure (400,000 C++ lines) running across 1000 machines.
- Doubled the amount of pages crawled (over 6 billion) and improved the refresh frequency for individual web pages by developing the idea of adaptive crawling.

Rutgers University, New Jersey, USA

Research assistant, 2000 – 2004

Resource management for federated computer systems, *with Dr. Thu Nguyen, 2001 – 2004*

Studied infrastructural support for managing data and replicated services in federated computing environments. Federated systems are typically comprised of heterogeneous components spanning multiple organizations; thus, a major challenge for building federated applications is the lack of centralized control and high system volatility. A completely decentralized framework, which provides global and coherent control of resources, was constructed to address these challenges (33000 Java lines). Stochastic models and simulations (18000 Perl lines) were used in the design phase to predict performance and scalability. To date, this work has been successfully tested on deployments spanning over 100 universities around USA and has been cited in over 40 scientific publications.

Cooperative caching on clusters, *with Dr. Thu Nguyen, 2000 – 2001*

Studied the use of a generic cluster-wide page cache to increase throughput on stock web servers.

Research found that servers using the cooperative caching middleware layer could achieve 92% of the performance, when compared to specialized cluster based servers that implement request distribution.

FAMAF – Universidad Nacional de Cordoba, Cordoba, Argentina

Using neural networks to forecast air pollution levels, *with Dr. Sergio Cannas, 1999*

Evaluated the use of artificial neural networks and linear regression models for predicting air pollution levels. The study was done using historical pollution data from the city of Cordoba. Several distributed implementations were studied in order to be able to compute the forecast in less than one hour.

Harvest SA, Cordoba, Argentina

External Consultant, 1999

Hired by Harvest SA to work with their largest client, Red Vial Centro, to assist in the development of software for controlling highway toll stations. Red Vial Centro is a private company that owns over 200 miles of highways on the province of Cordoba.

Highlights:

- Provided expertise on embedded systems and UNIX environments to design hardware and software interfaces for controlling road sensors. Worked with a mix team of Electrical Engineers, toll station maintainers and operators (12000 C++ lines).
- Created a hot replacement facility to minimize toll booth downtime.

Environmental Observatory of Cordoba, Cordoba, Argentina

Software Engineer, 1997-1999

System Administrator, 1996-1999 (*concurrent with the above*)

The Environmental Observatory is a government agency, responsible for monitoring the air quality of Cordoba city (1.5 million people). On a daily basis thousands of air samples are automatically collected and analyzed around the city. This data is periodically transmitted to a central station where is used to detect and predict unhealthy pollution levels.

Highlights:

- Assisted in the process of reducing operational costs by developing in-house systems to replace imported software. Worked with personnel in multiple areas to study software requirements.
- Designed and developed control software for unmanned monitoring stations. A major challenge was to provide uninterrupted service and autonomous operation. A Tandem like hardware and software architecture with redundant communications channels, control units and instruments was used to accomplish the task (8000 C++ lines).
- Supervised and coached IT teams working on Data Warehousing, Geographic Information Systems and Multimedia development.
- Reduced software license costs by migrating existing Novel Netware servers to open source UNIX implementations (30+ clients).
- Designed an active security scheme to protect the internal network against Internet attacks. This scheme has endured over 6 years of uninterrupted service.

Nanotesla Inc., Maryland, USA

Embedded Software Developer, 1995 & 1996

Nanotesla INC manufactures magnetometers that are used primarily for petrol excavation and space exploration.

Highlights:

- Worked on the development of their new portable unit, writing data analysis and control software for Windows.
- Programmed a Z180 microcontroller, embedded on a magnetometer, to provide real-time data logging and PC communication.

Consultores en Informatica SA, Cordoba, Argentina

External Consultant, 1994

Hired by Consultores en Informatica to provide expertise on multimedia systems for two of their contracts with the provincial government of Cordoba (a 3 million people province).

Projects:

- **Banco de Cordoba** – Designed multimedia kiosks for selling real state. Provided software libraries to allow developers to interface existing real state database with multimedia kiosks (4000 VB lines).
- **Cordoba's Tourist Office** – Designed multimedia kiosks for providing tourist information. These kiosks were supported by hotels that offered accommodations through them (6000 VB lines).

SELECTED PATENTS & PUBLICATIONS – 800+ citations

“Reliable end-point visibility”, US Patent, filed on 2015

“Method for seamlessly integrating access control mechanisms for media in social networks web-sites”.

US Patent 13/997,108 filed on September 2013

“Web Enclaves and Secure Cloud Enclaves”. Provisional US filing on July 2013

“Augmented reality based security”. US Patent US13/630655 filed on February 2012

“A System and Method to Protect User Privacy in Multimedia Uploaded to Internet Sites”. US Patent US11/064492 filed on June 2012

This patent spawned McAfee's Social Protection Service

“Reducing the Availability Management Overheads of Federated Content Sharing Systems”. C. Peery, F. M. Cuenca-Acuna, and T. D. Nguyen. In Proceedings of the 25th IEEE Symposium on Reliable Distributed Systems (SRDS), October 2006.

“Self-Managing Federated Services”. F. M. Cuenca-Acuna and T. D. Nguyen. In Proceedings of the 23rd IEEE Symposium on Reliable Distributed Systems (SRDS), October 2004.

“Autonomous Replication for High Availability in Unstructured P2P Systems”. F. M. Cuenca-Acuna, R. P. Martin and T. D. Nguyen. In Proceedings of the 22nd IEEE Symposium on Reliable Distributed Systems (SRDS), October 2003.

“PlanetP: Using Gossiping to Build Content Addressable Peer-to-Peer Information Sharing Communities”. F. M. Cuenca-Acuna, C. Peery, R. P. Martin and T. D. Nguyen. In Proceedings of the 12th IEEE International Symposium on High Performance Distributed Computing (HPDC), June 2003

Reprinted in 2012 as one of the best papers in HPDC history

“Cooperative Caching Middleware for Cluster-Based Servers”. F. M. Cuenca-Acuna and T. D. Nguyen. In Proceedings of the 10th IEEE International Symposium on High Performance Distributed Computing (HPDC), August 2001.

INVITED TALKS (recent years)

- "Ejecutando proyectos de innovación tecnológica de software en Intel (una empresa de hardware)", PMI Tour Cono Sur Mendoza 2015
- "The evolution of the Software Engineering practices at the Industry", Famaf – UNC, September 2015
- "Examples of Cloud Computing", Cordoba TechDay, September 2014
- "How to retire in Computer Science doing technical work", Hackers and Founders Córdoba, November 2014
- "Using the Intel Updater for FW update & TCB recovery ", Intel Firmware Summit, May 2011
- "Improving quality and time-to-market in consumer software", SW Professionals Conference, 2010
- "Advances in hardware technologies to combat enterprise security threats", CACIC, October 2008

OPEN SOURCE CONTRIBUTIONS

- Web of things (W3C), 2014
- Webduino, 2013
- TCPDUMP, 2000

TEACHING EXPERIENCE

- Undergraduate course on "Computer Networks", FAMAF - UNC, 2007
- Undergraduate course on "Operating Systems", FAMAF - UNC, 2006
- Undergraduate thesis advisor of Marcos Dione (2002-2004) & Gustavo Petri (2004-2005) (joint work with Lic. Wolovick), FAMAF – UNC
- Graduate course on "Distributed Systems", FAMAF – UNC, 2004
- TA of "Operating Systems" and "Computer Applications for Business", Rutgers University, 1999-2001
- TA of "Operating Systems", "Computer Architecture" and "Paradigms of programming languages", FAMAF – UNC, 1996-1999

CONFERENCE REVIEW & COORDINATION ACTIVITIES

Transactions on Information Systems (IEEE 2011), STIC AmSud (2011), SAC Software Verification and Testing (ACM 2009), Transactions on Knowledge and Data Engineering (IEEE 2008), Transactions on Software Engineering (IEEE 2007), QEST (2006), INFOCOM (IEEE 2006), INFOCOM (IEEE 2005), The computer journal (Oxford Press 2005), Conferencia Latinoamericana de Informática (CLEI 2004), Information Processing & Management Journal (Elsevier 2004), International Conference on Parallel and Distributed Systems (IEEE 2004)

SKILLS

- **Programming Languages:** C/C++, Java, JavaScript, Perl, embedded programming (x86, ARM, ARC)
- **Web technologies:** NodeJS, J2EE, Tomcat, Web Services, Grid Computing, XML (SAX, DOM, XPATH), SOAP, RMI, UDDI, LDAP
- **Operating Systems:** MS Windows, UNIX, Linux
- **Others:** Fluent in Spanish, Significant travel exposure (South America, Europe, Asia and Africa)