Dr. Gustavo Betarte

Short CV – June 2022

Full Professor, Department of Computer Science (InCo), Facultad de Ingeniería, Universidad de la República (FING-Udelar), Montevideo, Uruguay. Off. Tel: +598 27142714 Ext. 10126, email: gustun@fing.edu.uy

Education

I received a BSc. degree in Computer Engineer (1990) from FING-Udelar, and a MSc. (1993) and a PhD. (1998) in Computing Science from the University of Gothenburg, Sweden.

Professional activity in the last five years

- Full Professor of the Department of Computer Science (InCo), FING-UdelaR, Uruguay. Since May 2010.
- Principal researcher and head of the Computer Security team (GSI) of FING-UdelaR, Uruguay. Since April 2006.
- Chair of the Informatics Area, Programa de Desarrollo de las Ciencias Básicas (PEDECIBA), Uruguay (2018-2020).
- Contributing member of the National Honorary Advisory Scientific Group (GACH), the scientific advisory group of the Uruguayan government analyzing recommendations in the area of data science to the COVID-19 Transition UY government team.

Funded research projects

Current Project

- *ModSecIntl: A machine learning-assisted web application firewall.* Source of funding: Fondo de Innovación en Ciberseguridad de la OEA, Cisco y Fundación Citi, edition 2020. Project leader and researcher.

Recent Projects

- *PROTECT (Privacy Oriented TEchniques for the assurance of Contact Tracing solutions).* Source of funding: CSIC, Universidad de la República. 2020. Project leader and researcher.
- *Automation of knowledge derivation for the assurance of computer systems. Source of funding: Fondo María Viñas, Research and Innovation National Agency (ANII, Uruguay). 2018-2021. Project leader and researcher.*
- *Certified autonomic mechanisms for mobile security.*. Source of funding: Fondo Clemente Estable, Research and Innovation National Agency (ANII, Uruguay). 2015-2018. Project leader and researcher.
- *AKD: Autonomic Knowledge Discovery for Security Vulnerability Prevention in Self-governing Systems*. Source of funding: Program STIC-Amsud. 2015-2016. National coordinator and principal researcher.
- *VirtualCert: Towards a Certified Virtualization Platform.* Sources of funding: Fondo Clemente Estable, Research and Innovation National Agency (ANII, Uruguay), 2009-2011 and CSIC I+D (UdelaR), 2012-2014. Project leader and researcher.

Relevant Publications (last five years)

1. N. Montes; G. Betarte; R. Martínez; A. Pardo, *Web Application Attacks Detection Using Deep Learning Techniques*. In proc. of 25th Iberoamerican Congress on Pattern Recognition (CIARP 2021), LNCS 12702, 2021.
2. G. Betarte; M. Cristiá; C. Luna, A. Silveira; D. Zanarini, Set-Based Models for Cryptocurrency Software. CLEI Electronic Journal, Vol. 24 No. 3 (2021): Regular papers and Special Issue For Digital Healthcare, 2021.
3. A. Silveira; G. Betarte; M. Cristiá; C Luna, A Formal Analysis of the Mimblewimble Cryptocurrency Protocol. Sensors 21(17): 5951, 2021.
4. F. Molina; G. Betarte; C. Luna, Design principles for constructing GDPR-compliant blockchain solutions. In IEEE/ACM 4th International Workshop on Emerging Trends in Software Engineering for Blockchain (WETSEB), ICSE, 2021.
5. G. Betarte; M. Cristiá ;C. Luna, A. Silveira; D. Zanarini, Towards a formally verified implementation of the MimbleWimble cryptocurrency protocol. International Conference on Application Intelligence and Blockchain Security, 2020.
6. G. Barthe; G. Betarte; J. Campo; C. Luna; D. Pichardie, System-Level Non-interference of Constant-Time Cryptography. Part II: Verified Static Analysis and Stealth Memory. Journal of Automated Reasoning, 2020.

7. G. Barthe; G. Betarte; J. D. Campo; C. Luna, System-Level Non-interference of Constant-Time Cryptography. Part I: Model. Journal of Automated Reasoning, 2019.
8. G. Betarte; E. Giménez; R. Martínez; A. Pardo, Improving Web Application Firewalls through Anomaly Detection. International Conference on Machine Learning and Applications 2018: 779-784, 2018.
9. G. Betarte; A. Pardo; R. Martínez; Web Application Attacks Detection Using Machine Learning Techniques. International Conference on Machine Learning and Applications 2018: 1065-1072, 2018.
10. D. Pedraja; J. Baliosian; G. Betarte, Offloading Cryptographic Services to the SIM Card. Latin American Symposium on Dependable Computing 2018: 47-56, (2018), 2018.
11. G. Betarte; J. D. Campo; F. Gorostiaga; C. Luna, A certified reference validation mechanism for the permission model of Android. 27th International Symposium on Logic-Based Program Synthesis and Transformation (LOPSTR), 2017.
12. G. Betarte; J. Campo; M. Cristiá; F. Gorostiaga; C. Luna; C. Sanz, Towards formal model-based analysis and testing of Android's security mechanisms, CLEI 2017, 2017.

Thesis supervision (last seven years)

1. Juan Diego Campo, *Formally Verified Countermeasures against Cache Based Attacks in Virtualization Platforms*, Ph.D. in Computing Science, PEDECIBA, 2015.
2. Carlos Luna, *Formal analysis of security models for mobile devices, virtualization platforms, and domain name systems,* Ph.D. in Computing Science, PEDECIBA, 2014.
3. Daniel Pedraja, *Secure offloading of cryptographic mechanisms*, MSc in Computing Science, PEDECIBA, 2018.
4. Rodrigo Martínez, *Enhancing web application attack detection using machine learning*, MSc in Computing Science, PEDECIBA, 2019.
5. Nicolás Montes, *Web Application Attacks Detection Using Deep Learning*, Maestría en Ingeniería Matemática, Facultad de Ingeniería, Uddelar, 2021.
6. Fernanda Molina, *Towards personal data protection compliant Blockchain technology*, MSc in Computing Science, PEDECIBA, 2021.
7. Adrián Silveira, A formal analysis of the MimbleWimble cryptocurrency protocol with a security approach, MSc in Computing Science, PEDECIBA, 2022.
8. Juan Pablo Perata, Análisis de seguridad de la plataforma de ciudades inteligentes Fiware, MSc in Computer Security, FING-Udelar, ongoing.
9. Marcelo Rodríguez, *Modeling web attacker profiling: a process mining-based approach,* MSc in Computing Science, PEDECIBA, ongoing.
10. Nicolás Serrano, *Privacy in mobile applications: risks in the use of third-party libraries,* MSc in Computing Science, PEDECIBA, ongoing.
11. Guillermo Guerrero, Dynamic Generation of Attack Targets in Cyber Ranges, MSc in Computing Science, PEDECIBA, ongoing.

Scientific Societies

Dr. Betarte is a member of the Uruguayan Researchers National System (SNI, Level II). He is also a researcher (Grado 4) of PEDECIBA – Informatics.

Relevant activity in the ICT sector

- *Research and Development Engineer at Trusted Logic SA, Versailles, France, (2001-2005).* Trusted Logic was a start-up from INRIA, specialized in both the development of embedded systems based on the Java technology and the security evaluation of those systems. Some of the activities developed during this period:
  - ✗ Principal co-author of the Java Card System Protection Profile Collection. This work was developed by Trusted Logic on behalf of Sun Microsystems Inc. The (four) protection profiles were certified, at level EAL4+ of the CC (Common Criteria for Information Technology Security Evaluation, ISO/IEC 15408), by the French certification body DCSSI (Direction Centrale de la Sècuritè des Systèmes d'Information) in September 2003.
  - ✗ Member of the FORMAVIE team, which developed the security methodology CC EAL7 applied to the Java Card System. The main objective of the FORMAVIE project was to develop a formal setting for the verification of security properties concerning the process of verifying, loading and executing an applet in the Java Card 2.1.1 platform. This methodology was certified by the DCSSI in July 2003.

- *Technical Director of the Computer Security Consulting Team of Tilsor SA, Montevideo, Uruguay.* Since 2006.

For more detailed information please check the full CV and DBLP list of publications.