

Alejandro Calleja

Curriculum Vitae

Education

- 2014–Present **PhD Computer Science**, *Universidad Carlos III*, Madrid.
- 2013–2014 **MSc. of Computer Science and Technology**, *Universidad Carlos III*, Madrid.
Specialized in Distributed Systems and Security
- 2009–2013 **Bachelor of Computer Science**, *Universidad Carlos III*, Madrid.
Specialized in Computer Engineering

PhD Thesis

- Title *Automated malware analysis techniques* (Tentative)
- Supervisors Professor Juan E. Tapiador
- Description In this thesis we explore new techniques for characterizing and classifying malicious software samples. We focus our efforts on malicious software targeting mobile platforms such as Android or iOS.

Masters Thesis

- Title *Reviewing the use of electrocardiogram signals as source of entropy on implantable medical devices*
- Supervisors Professor Pedro Peris-Lopez & Professor Juan E. Tapiador
- Description The use of heart Inter-Pulse Intervals (IPI) has been proposed as source of entropy for key generation and negotiation algorithms in Implantable Medical Devices (IMD) and Body Area Sensor Networks (BASN). In this paper we present an analysis of the security of the IPI feature by comparing a heart signal captured using traditional contact-based techniques against a signal retrieved using a contactless technique. Our results show that up to the 70% of the information obtained by means of the contact-based method can be extracted from the signal taken by means of the contactless method.
- Grade 9.0 out of 10

Title *Extracting Semantic Information in wireless Network*
Supervisors Jorge Blasco Alis & Guillermo Suarez-Tangil
Description In this work we designed and developed a network sniffer focused on capturing semantic information such as HTTP messages or DNS queries made by the users in a wireless network.
Grade 9.5 out of 10

Experience

2014–Present **Research Assistant**, *Computer Security Lab (COSEC)*, Universidad Carlos III de Madrid, Development of different research tasks related with the main topics discussed in my PhD Thesis.

Detailed achievements:

- Analysis and reverse engineering of malware samples targeting Windows, desktop Unix and Android platforms
- Design of experiments and conclusion drawing
- Writing of scientific texts
- Spread of scientific results via conference and journal articles

2013–2014 **Research Intern**, *Computer Security Lab (COSEC)*, Universidad Carlos III de Madrid, Design of a collaborative system to fill in and submit European accident statements using the smartphones of both drivers (currently, only the mobile phone of one of the drivers is used and the contents of the form must necessarily be agreed between both drivers). Funded by Fundacion Mapfre, Spain (Research grants Ignacio H. de Larramendi 2013).

Detailed achievements:

- Design and implementation of a complete Android application, paying special attention to security and privacy requirements
- Design and implementation of server side components using J2EE technology
- Implementation of digital signature features using XAdes and CERES smartcards
- Implementation of middleware software interfacing between server components and the keystore included in the smartcard

2011–2012 **Intern at Computing and Communications Service**, *Universidad Carlos III de Madrid*.

Management and maintenance of Computing resources, user assistance, network maintenance and system administration

Research Projects

2014–Present **SPINY: Security and Privacy in the Internet of You.**, *Ministerio de Economía y Competitividad, Gobierno de España*, Ref. TIN2013-46469-R.

2014–Present **Indra's Cybersecurity chair**, *Indra Company & Universidad Carlos III de Madrid*.

Computer skills

Basic C/C++, Matlab, R, Javascript, SQL
Intermediate R, \LaTeX , Office suite, Unix, Microsoft Windows, OS X
Advanced Android app development, Python

Languages

Spanish **Mothertongue**
English **Intermediate**
German **Basic**

Fluent in spoken and written english
Certified A2 Level

Teaching

- *Introduccion a la Ciberseguridad*. Taught at Universidad Carlos III de Madrid as a subject within the *Scientific summer camp* program (Summer 2016).
- *Seguridad de la información*. Taught at Centro Universitario de la Guarcia Civil as a subject within the *Cursos de complemento de formación* program (Fall 2016)

Publications

- A. Calleja, P. Peris-Lopez, J.E. Tapiador. *Electrical Heart Signals can be Monitored from the Moon: Security Implications for IPI-based Protocols*. WISTP 2015, LNCS 9311:36-51 (2014). Springer-Verlag.
- S. Pastrana, J. Rodriguez-canseco, A. Calleja. *ArduWorm: A Functional Malware Targeting Arduino Devices*. Jornadas Nacionales de Investigacion en Ciberseguridad 2016, Granada, Spain. **(Best Paper Award)**
- A. Calleja, J. Tapiador, J. Caballero. *A Look into 30 Years of Malware Development from a Software Metrics Perspective*. 19th International Symposium on Research in Attacks, Intrusions and Defenses (RAID 2016), Paris, France.