

Pablo Puñal Pereira

CONTACT INFORMATION	PhD Student in Industrial Electronics EISLAB (Embedded Internet Systems Lab) Luleå University of Technology SE-971 87 Luleå, Sweden	<i>Mobile:</i> +46 (0) 722 45 40 30 <i>Office:</i> +46 (0) 920 49 19 02 <i>E-mail:</i> pablo.punal@ltu.se <i>E-mail:</i> pablo@punyal.com <i>WWW:</i> www.punyal.com
RESEARCH INTERESTS	Wireless Secure Communications for Industrial Internet of Things: embedded systems, low-power, lightweight programming, automatic sign-in sign-out mechanisms, service registration, IPSO Smart Objects, OMA LWM2M, CoAP, REST, constrained and non-constrained servers, multiprotocol networks, real-time systems, IEEE802.15.4 and other wireless communications.	
ACADEMIC APPOINTMENTS	PhD Student , Luleå University of Technology Department of Computer Science, Electrical and Space Engineering	March 2012 (upcoming)
	<ul style="list-style-type: none">• Projects:<ul style="list-style-type: none">• Arrowhead• EMC²• Teaching courses:<ul style="list-style-type: none">• Introduction to Programming for Engineers• Real-Time Systems• Mechatronics• Mentoring other PhD students:<ul style="list-style-type: none">• Miguel Gómez Simón• Hasan Derhamy	
	Research Scientist , University of Valencia Department of Earth Physics and Thermodynamics	December 2008 to January 2010
	<ul style="list-style-type: none">• Project:<ul style="list-style-type: none">• SMOS - European Space Agency	
EDUCATION	Luleå University of Technology , Luleå, Sweden	
	PhD., Industrial Electronics, September 2016	
	<ul style="list-style-type: none">• PhD. Thesis Topic: <i>Efficient Access Control for the Industrial Internet of Things</i>• Licentiate Thesis Topic: <i>An Efficient Access Control Method for Resource Constrained Embedded Systems</i>• Supervisors: Jens Eliasson and Jerker Delsing• Area of Study: Industrial Electronic	
	University of Valencia , Valencia, Spain	
	M.S., Electronic Engineering, July 2011	
	<ul style="list-style-type: none">• Thesis Topic: <i>Design and experimental verification of a wireless protocol for RF Quadcopters</i>• Adviser: Assistant Professor Julio Martos Torres• Area of Study: Communication and Control Engineering	
	B.S., Electronic Engineering ¹ , September 2011	
	<ul style="list-style-type: none">• Thesis Topic: <i>Design, manufacture and verification of a RF Quadcopter</i>• Adviser: Assistant Professor Julio Martos Torres	

¹A five years degree corresponds, in the Bologna plan, to a Degree and a Master

- Area of Study: Communication and Control Engineering

University of Santiago de Compostela, Santiago de Compostela, Spain

B.S., Physics², September 2008

- Area of Study: Electronics

REFEREED
JOURNAL
PUBLICATIONS

- [1] Jerker Delsing, Jens Eliasson, Pal Varga, Pablo Puñal Pereira, Hasan Derhamy, Luis Ferreira, Michele Albano, Oscar Carlsson and Ove Jansson. Arrowhead Framework: an interoperability platform for IoT based automation systems. *IEEE Proceedings*. Accepted.
- [2] Rumen Kyusakov, Pablo Puñal Pereira, Jens Eliasson and Jerker Delsing. EXIP: A Framework for Embedded Web Development. *ACM Transactions on the Web*, 23, vol 8, October, 2014. doi:10.1145/2665068

CONFERENCE
PUBLICATIONS

- [3] Jerker Delsing, Jens Eliasson, Pablo Puñal Pereira and Joakim Gebart. The IoT Rockbolt. *5th International Conference on Internet of Things 2015*, October, 2015.
- [4] Hasan Derhamy, Jens Eliasson, Jerker Delsing, Pal Varga and Pablo Puñal Pereira. Translation Error Handling for Multi-Protocol SOA Systems. *Proceedings of 2015 IEEE 20th International Conference on Emerging Technologies & Factory Automation (ETFA 2015)*, September, 2015.
- [5] Pablo Puñal Pereira, Jens Eliasson and Jerker Delsing. An Authentication and Access Control Framework for CoAP-based Internet of Things. *IECON 2014 : 40th Annual Conference of the IEEE Industrial Electronics Society*, November, 2014.
- [6] Jens Eliasson, Pablo Puñal Pereira, Henrik Mäkitaavola, Jerker Delsing, Joakim Nilsson and Joakim Gebart. A Feasibility Study of SOA-enabled Networked Rock Bolts. *Proceedings of 2014 IEEE 19th International Conference on Emerging Technologies & Factory Automation (ETFA 2014)*, September, 2014.
- [7] Pablo Puñal Pereira, Jens Eliasson, Rumen Kyusakov, Jerker Delsing, Asma Raayatinezhad and Mia Johansson. Enabling cloud-connectivity for mobile internet of things applications. *Proceedings : 2013 IEEE 7th International Symposium on Service-Oriented System Engineering, SOSE 2013*, March, 2013.

THESIS
PUBLICATIONS

- [8] Pablo Puñal Pereira. Licentiate Thesis: "An Efficient Access Control Method for Resource Constrained Embedded Systems". *Luleå tekniska universitet*. Luleå, Sweden. October 2014.

BOOKS IN
PREPARATION

- [9] Arrowhead project. *Arrowhead* Author of the Chapter "Arrowhead Security". In preparation. April 2016.

²A five years degree corresponds, in the Bologna plan, to a Degree and a Master

SEMINARIES	<p>Embeeded Internet Systems University of Valencia, Valencia, Spain.</p>	8-10 July 2013
WORKSHOPS	<p>Arrowhead Technical Workshop Volvo Trucks, Göteborg, Sweden.</p>	16-17 November 2015
STUDENT ADVISING	<p>Miguel Gómez Simón PhD. Student in Mobile and Pervasive Computing, Division of Computer Science, Department of Computer Science, Electrical and Space Engineering Luleå University of Technology. 2014-2016.</p> <p>Hasan Derhamy PhD. Student in Industrial Electronics, Division of Embedded Internet Sistem Lab (EIS-LAB), Department of Computer Science, Electrical and Space Engineering Luleå University of Technology. 2014-2016.</p>	
TEACHING EXPERIENCE	<p>Luleå University of Technology, Luleå, Sweden</p> <p><i>Teaching Assistant</i></p> <ul style="list-style-type: none"> • D0017E: Introduction to programming for engineers <ul style="list-style-type: none"> • 7.5 credits • Bachelor's level • Courses: <ul style="list-style-type: none"> • 2012-2013 • 2013-2014 • 2014-2015 • D0003E: Real-Time System <ul style="list-style-type: none"> • 7.5 credits • Bachelor's level • Courses: <ul style="list-style-type: none"> • 2013-2014 • E7012E: Mechatronics <ul style="list-style-type: none"> • 7.5 cerdits • Master's level • Courses: <ul style="list-style-type: none"> • 2012-2013 	September 2012 to October 2015
PROFESSIONAL EXPERIENCE	<p>Luleå University of Technology, Luleå, Sweden</p> <p><i>PhD. Student</i></p> <ul style="list-style-type: none"> • Supervisors: Jens Eliasson and Jerker Delsing • Research and develop security mechanisms to protect wireless sensors/actuators IoT networks: <ul style="list-style-type: none"> • Implement and analyze different encryption protocol, in terms of power consumption and performance • Research and develop new techniques of access control for constrained devices • Research on multiprotocol networks, translators and interoperability • Develop drivers for sensors and actuators • Research techniques to optimize the low-power and processing time performance • Develop services for constrained and non-constrained servers 	March 2012 (upcoming)

Responsible of Security for Arrowhead project **January 2015 (upcoming)**

- Research and implement security mechanism for Arrowhead, a multiprotocol framework
 - Study the end to end security for communications with different protocols
 - Authorization, Authentication and Accounting solutions

University of Valencia, Valencia, Spain

Research Scientist **December 2008 to January 2010**

- Researcher for SmoS project as part of the European Space Agency (ESA)
- Responsible for soil measurement validation of the Spanish region

PROFESSIONAL MEMBERSHIPS Institute for Electrical and Electronics Engineers (IEEE), Member, 2011–present

- Founder of the IEEE Student Branch in Valencia (2011)
- Member of Internet Engineering Task Force (IETF):
- Thing to Thing Research Group (T2TRG)
 - Authentication and Authorization for Constrained Environments (ACE)
 - Light-Weight IP Protocol Design (lwip)

OTHER MEETING ATTENDANCE **Invited Participant**

- Talk "Access Control on Multiprotocol Networks" for T2TRG, 93rd IETF Meeting, 18th July 2015, Prague

APPLICATION AREAS Industrial Internet of Things, Internet of Things, Encryption, Access Control, , Constrained Devices, Service Oriented Architectures, Configuration Zero networks

HARDWARE AND SOFTWARE SKILLS Analog and Digital Electronics:

- Sensors, filters, actuators and drivers.
- Computer-Aided Design Tools: Cadence OrCAD, NI Multisim, SPICE, pst-circ, Eagle

Embedded and Real-time Systems:

- Hardware development with several MCU and DSP platforms (e.g., ARM, Texas Instruments DSP's, Atmel ATmega MCU's, Microchip PIC MCU's, and others)
- Software developer on Contiki OS and non-SO solutions

Instrumentation, Control, Data Acquisition, Test, and Measurement:

- NI Certified LabVIEW Associate Developer (CLAD) in 2011
- Control Desk software like Simulink, National Instruments control and data acquisition hardware and software (e.g., MIO, DSA, and others), Hewlett-Packard and Agilent bench-top equipment

Computer Programming:

- C, Java, Python, JavaScript, PHP, UNIX shell scripting (including POSIX.2), GNU make, AppleScript, SQL, MySQL, and others

Numerical Analysis:

- MATLAB, R, Mathematica

Version Control and Software Configuration Management:

- Git and SVN

MATLAB skill set:

- Linear algebra, Fourier transforms, Monte Carlo analysis, nonlinear numerical methods, polynomials, statistics, N -dimensional filters, visualization
- Toolboxes: control system, filter design, genetic algorithm and direct search, signal processing, system identification

Information/Internet Technology:

- Networking (UDP, TCP, ARP, DNS and SDN), Services (CoAP, HTTP, SQL, and application-specific daemon design)

EXPERTISE

Physics and Mathematics:

- Modeling, Data analysis, Autocalibration, Applied Mathematics, Real and Complex Analysis, Measure Theory, Differential Geometry, Graph Theory, Combinatorics

Control Theory and Engineering:

- Linear and Nonlinear Systems Theory, Feedback, Distributed and Intelligent Control, Dynamic Optimization, Hybrid and CyberPhysical Systems

Communications and Signal Processing:

- Probability, Random Variables, Stochastic Processes, Information Theory, Estimation, Networks

Computer Science and Engineering:

- Optimization for low-power devices, Software Verification, Component-Based Reusable Software

SCHOLARSHIPS

Academic Scholarships

- Erasmus plus for teaching during two weeks at University of Valencia, April 2016.

AWARDS

International Awards

- IPSO Challenge 2015, first prize with the "Smart Rockbolt". IPSO Alliance, San Jose, December 2015

REFERENCES
AVAILABLE TO
CONTACT

Dr. Jens Eliasson (e-mail: jens.eliasson@ltu.se; phone: +46(0)920 49 22 41)

- Associate Professor in Industrial Electronics, EISLAB, Luleå University of Technology
- ◇ Luleå University of Technology, SE-971 87 Luleå, Sweden
- ★ *Dr. Jens is my current PhD. supervisor.*

Prof. Jerker Delsing (e-mail: jerker.delsing@ltu.se; phone: +46(0)706261931)

- Professor in Industrial Electronics, EISLAB, Luleå University of Technology
- ◇ Luleå University of Technology, SE-971 87 Luleå, Sweden
- ★ *Prof. Jerker is my current PhD. cosupervisor.*

MORE
INFORMATION

More information and auxiliary documents can be found at
<http://www.punyal.com>.