

CURRICULUM VITAE - FEDERICO GUERRA

GENERAL INFORMATION

<i>Place, date of birth:</i>	Padua, Italy, 09/09/1982
<i>Nationality:</i>	Italian
<i>Address:</i>	<i>removed for privacy</i>
<i>Telephone:</i>	<i>removed for privacy</i>
<i>E-mail:</i>	federico@guerra-tlc.com
<i>Marital status:</i>	Not married
<i>Driving license:</i>	Italian "B" license
<i>Personal website:</i>	http://www.guerra-tlc.com

SHORT BIOGRAFY

Federico Guerra was born in Padua, Italy, on September 9, 1982. He received the Laurea degree (B.E.) in Information Engineering in 2005 and Laurea Specialistica degree (M.E.) in Telecommunications Engineering in 2008 from the University of Padua, Italy.

Shortly after graduating he joined the research team of [Consorzio Ferrara Ricerche \(CFR\)](#) under the direction of Professor [M. Zorzi](#). During his time in CFR he participated in a collaboration with [NURC](#) (Nato Undersea Research Centre, la Spezia, Italy) on MAC analysis and development and he was involved in the definition of the [JANUS](#) signaling standard.

In July 2009 he joined [Patavina Technologies](#) research and development department to work on projects involving programming and software design on underwater acoustics and wireless sensors networks. He spent two month at NURC centre as a contractor on network simulation issues.

In March 2011 he joined [u-blox](#), a leading fabless semiconductor provider of embedded positioning and wireless communication solutions for the consumer, industrial and automotive markets, as **Software, Protocol Stack, Engineer**.

In May 2011 he also became a **consultant** for CFR on underwater acoustic network simulation topics.

His **main interests** are 2G/3G and beyond protocol stack analysis and development for embedded wireless modules and solutions.

His **research interests** are underwater acoustic and wireless sensor networks.

Regarding **network simulation**, he is one of the developer and he was the last maintainer of [Miracle](#), a world-wide used NS2 framework extension for cross-layer and multi-technologies design.

As to **underwater networks**, his focus is on MAC and DTN (Delay Tolerant Networks) protocols analysis, design and implementation. He recently developed for NURC an underwater simulation framework called [World Ocean Simulation System \(WOSS\)](#) presented at WUWNet 2009, Berkley, CA. He was involved in a two year collaboration with NURC on MAC analysis and protocol design and he took part in two research projects on network analysis and design: a [FP7](#) funded project called **CLAM** (CoLIAborative eMbedded networks for submarine surveillance), and an [IIT](#) funded project called **NAUTILUS** (Network Architecture and protocols for Underwater Telerobotics via acoustic Links in Ubiquitous Sensing, monitoring and explorations).

As to **wireless sensor networks** his focus was on communication technologies development and implementation on embedded systems. He was involved in the FP7 funded **SWAP** (Symbiotic Wireless Autonomous Powered system) project.

EMPLOYMENT HISTORY

March 2011 – present	U-blox – Software Engineer, protocol stack: wireless protocol stack analysis, development and debugging for 2G, 3G and beyond M2M wireless products: <ul style="list-style-type: none">• Advanced C/C++ programming on ARM-based baseband processor, based on ClearCase revision control system.• 3GPP Protocols expertise: physical layer, RLC, MAC, RRC, NAS, etc.• involved in the development of the CellLocate technology.
May 2011 – present	Consorzio Ferrara Ricerche – Consultant: consultant on underwater acoustic network simulation topics: <ul style="list-style-type: none">• advanced c++ and design patterns programming;• further development of the WOSS framework.
August 2010 – February 2011	Teletronica S.p.A. – Telecom. engineer and sales account: network, security and telecom. systems design and analysis, such as VoIP and analog communications, structured cabling and remote video surveillance.
July 2009 – August 2010	Patavina Technologies – Telecommunications and software engineer: design, development, simulation and implementation of telecommunication technologies in wireless sensors networks, underwater acoustic networks, radio networks.
September 2008 – July 2009	Consorzio Ferrara Ricerche – Telecommunications and software engineer: design, development, implementation, and simulation of MAC protocols, in collaboration with NURC centre (<i>NATO Undersea Research Centre</i>) in la Spezia, Italy and with the University of Padua, Italy.
2007	E.T.A.P. - A.U.S.S.L. 16, Padua – IT Technician: hardware, software and network issues.
January 2003 – December 2005	Ad Hoc Soluzioni Srl – Sales force commitment: IT promoter. Collaboration interrupted to fully commit to studies.

EDUCATION

January 2009 – July 8, 2008	Professional Engineering Examination – passed at University of Padua, Italy. Laurea Specialistica (M. E.) in Telecommunications Engineering – University of Padua, Italy. Final graduation mark: 108/110. Thesis title: “ On a comparative study of broadcast protocols based on fountain codes in underwater acoustic networks ”. Supervisor: professor M. Zorzi.
September 8, 2005	Laurea Triennale (B. E.) in Information Engineering – University of Padua, Italy. Thesis title: “ <i>On simulation of Hybrid ARQ protocols</i> ”. Supervisor: professor M. Zorzi.
July 12, 2001	Diploma di Liceo Scientifico – Liceo Scientifico Statale (State Grammar School – Science Course) “Enrico Fermi”, Padua, Italy.

PROFESSIONAL TRAININGS

October 2010 – December 2010	CNAPONLINE – CISCO CCNA 1+2 – Cisco Certified Network Associate: Interconnecting Cisco Devices 1 + 2.
January 2011 – March 2011	CNAPONLINE – CISCO CCNA 3+4 – Cisco Certified Network Associate: Interconnecting Cisco Devices 3 + 4.

SCIENTIFIC ACTIVITY

Network Simulation	Network simulation is a crucial step in telecommunication technologies analysis, design and development, especially in the early stages of production, when real devices are scarce and production costs are high. An exhaustive simulation with a <i>valid</i> model, could detect design errors and reveal problematic that a simple test bed would not. Since his M.E. studies Federico Guerra helped developing <i>Miracle</i> , a popular framework which extends ns2 to facilitate the simulation and the design of beyond 4G networks. Miracle provides an efficient and embedded engine for handling cross-layer messages and, at the same time, enabling the coexistence of multiple modules within each layer of the protocol stack. Federico Guerra is Miracle project leader and he is currently focusing on several
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technologies (like *LTE, Long Term Evolution*), MAC and DTN protocol implementation.

Underwater Acoustic Networks Underwater networks are foreseen to provide a fundamental tool for supporting a wealth of applications requiring the use of mobile as well as fixed nodes in diverse fields, from environmental monitoring to support in answering distress calls, intrusion detection, and so forth. At Patavina Technologies Federico Guerra is currently focusing on MAC, DTN and routing issues.

He also developed a multi-threaded simulation framework called [World Ocean Simulation System \(WOSS\)](#), that aims to accurately model the underwater channel. Thanks to its vast collection of environmental data gathered from the most important public databases, it allows simulations in almost every part of the world. WOSS has been adopted by NURC for its own research projects.

Wireless Sensor Networks Data dissemination and broadcast are fundamental communication paradigm for efficient sensor reprogramming and sensor data retrieval. An optimal protocol should be fast, reliable, scalable, and should minimize energy consumption avoiding unnecessary retransmissions. At Patavina Technologies Federico Guerra is focusing on HARQ (Hybrid-ARQ) protocols based on fountain codes. These codes are rateless, i.e., the amount of redundancy is not fixed prior to transmission but can be decided on the fly as the error recovery algorithm evolves. Fountain codes are known to be asymptotically near-optimal for every erasure channel and extremely efficient as the size of the message to transmit grows. FCs work on packet units by means of simple XOR operations, which allows for lightweight implementation of encoder and decoder. This makes these codes considerably faster than, e.g., traditional Reed Solomon codes.

COLLABORATIONS AND RESEARCH PROJECTS

NURC From 2008 to mid 2010 he participated in a collaboration with the NATO centre on analysis, design, development, simulation and dimensioning of MAC and routing protocols. He spent two month as a contractor at the centre and he participated in the definition process of the MAC layer of [JANUS](#), a NATO open standard for unsolicited broadcast and beaconing.

CLAM *CoLIAborative eMbedded networks for submarine surveillance* is funded by the [European Commission](#); its objectives are the underwater channel characterization and the development of MAC and routing protocols for active and passive surveillance.

NAUTILUS *Network Architecture and protocols for Underwater Telerobotics via acoustic Links in Ubiquitous Sensing, monitoring and explorations* is funded by [IIT \(Italian Institute of Technology\)](#); it aims to develop communication and behavioral protocols for autonomous vehicles in monitoring scenarios.

SWAP *Symbiotic Wireless Autonomous Powered system* is funded by the [European Commission](#); its goal is the development of a new wireless sensors platform, which, by exploiting different types of harvested energy, would be able to function unassisted for very long time.

PUBLICATIONS

S. Azad, P. Casari, F. Guerra, M. Zorzi M.S. Rahim,	On ARQ strategies over Random Access Protocols in Underwater Acoustic Networks	OCEANS 2011
P.Casari, F.Guerra, M. Zorzi	On the Performance of Delay-Tolerant Routing Protocols in Underwater Acoustic Networks	OCEANS 2011
N.Baldo, M. Miozzo, F.Guerra, M. Rossi, M. Zorzi	Miracle: the Multi-Interface Cross-layer Extension of ns2	Eurasip Journal 2010
F. Guerra, P. Casari, M. Zorzi	World Ocean Simulation System (WOSS): a simulation tool for underwater networks with realistic propagation modeling	WUWNet 2009
F. Guerra, P. Casari, M. Zorzi	A performance comparison of MAC protocols for underwater networks using a realistic channel simulator	OCEANS 2009
F. Guerra, P. Casari, M. Zorzi	MAC protocols for monitoring and event detection in underwater networks employing a FH-BFSK physical layer	UAM 2009

LANGUAGE SKILLS

<i>Italian</i>	Mother tongue.
<i>English</i>	Fluent speaking and writing. PET Certificate (Preliminary English Test) taken in June 2000 at the "Oxford School of English", Padua, Italy.
<i>French</i>	Basic knowledge of spoken and written French.

ICT SKILLS

<i>Operating systems:</i>	Linux (skilled user), Windows (any version).
<i>Application suites:</i>	Matlab, Latex, Microsoft Office suite, Open Office suite, ClearCase suite, SVN.
<i>Programming languages:</i>	C++, C, Java, Tcl, Perl, Python, Bash, HTML, CSS.
<i>Programming techniques:</i>	OOP (Object Oriented Programming), design patterns, C++ templates meta-programming, multi-thread design.
<i>Telecommunication Technologies:</i>	knowledge of recent technologies and protocols: GSM, UMTS, LTE, WiFi, Bluetooth, underwater acoustic communications, IP, TCP and of most common MAC, network, transport and application protocols.
<i>Telecommunication skills:</i>	Analysis and implementation of most common protocols and technologies, development and simulation of new ones.

I give my consent that the information contained in this CV be used for staff purposes, in compliance with the current national (D.Lg.196/03) and international laws.

Padua, November 10, 2011

Faithfully,

