Giulio Luzzati, Ph.D.

Personal Information

Research Software Engineer
1b Mill Road, Haddenham, Ely
Phone: +44 07397 791131
e-mail: giulio.luzzati@live.it
LinkedIn: https://it.linkedin.com/in/giulio-luzzati-9bb79245
Born: 19/10/1984, Genova, Italy

In a Nutshell

I am a software engineer with a strong scientific background. My drive is to design and analyse things and mechanisms, understand what makes them tick and how they could be better. I strive to frame my projects within the bigger picture, to deliver properly engineered, dependable and reusable solutions.

Education

University of Genova, Genova, Italy
Ph.D. in Computer Science **Apr 2016**
Thesis topics: resource allocation, communication networks, signal processing
Professional Engineering Qualification **Oct 2012**
M.Sc. in Telecommunication Engineering **May 2012**

Professional and Academic Experience

Cambridge Touch Technologies (CTT), Cambridge, United Kingdom
Senior DSP Engineer **Oct 2018 - Current**

CTT is a touch screen technology startup, providing cost effective and minimal overhead ways to add pressure sensing capabilities to touchscreen technologies. At CTT I'm in charge of designing and realizing several projects and tools to diagnose, test and benchmark components of the hardware stack. On top of that, I was tasked with the rearchitecturing and realization of the company's software assets versioning and CI infrastructure.

5G Innovation Centre, Guildford, United Kingdom
Senior Software Engineer **Nov 2017 - Oct 2018**

The 5GIC is a research centre within the University of Surrey, featuring one of the biggest 5G testbeds in the UK and carrying on research and standardization activity in close partnership with some of the largest players in the field. The 5GIC's testbed, a complete cellular network, showcases several research ideas, from the physical layer to network concepts. At the 5GIC I was part of the core network team. My contribution as a software engineer was to develop and maintain the code base for the core network.

AKYA ltd, Swindon, United Kingdom
DSP Software Engineer **Dec 2016 - Nov 2017**

AKYA's core business was a novel "dynamically reconfigurable logic" approach to hardware design, for low power/low cost applications, unlike e.g. FPGA, providing "just enough" reconfigurability to meet design requirements. At AKYA I contributed as a software engineer to the codebase of a framework to synthesise logic from a high-level description of the hardware. My role was to design and develop algorithms and software components that expand and integrate the existing framework, as well as creating tools for testing and data visualization.

DSP Lab, University of Genova, Genova, Italy
Post Doctoral Research Fellow **Jan 2016 - Nov 2016**
Ph.D. Student **Jan 2013 - Dec 2015**
Research Fellow **Oct 2012 - Dec 2012**

During my academic experience at the DSP Labs, as Ph.D. student and then research fellow, I carried out academic (research and teaching) activity, along with projects in collaboration with SMEs and some of the key industries of Italy's communications and tech (Telecom Italia, Leonardo). My main area of research were resource allocation and mathematical optimization in communication networks and in signal processing

Technical Skills

C++	●●○	C	●●●
Python	●●●	Matlab	●●○
Latex	●●○	Java	●○○

Software Architecture	Build Systems	CI, DevOps
Containerization	Embedded Development	Basic Hardware Diagnostics
Service Oriented Architecture	Agile Software Development	GNU/Linux OS

Scientific Skills

Signal processing
Computer networks
Statistics, data science
Mathematical optimization
Working knowledge in machine learning
Scientific writing and teaching

Relevant Projects

Signal Injector for Pressure Sensors

Project manager, Cambridge Touch Technologies **2019**

The goal of the project was to realize a signal injector, able to "simulate" the behaviour of the physical sensor. An array of DACs at its core, the deliverable consisted in a small box, controlled via REST api, able to physically interface to the pressure sensor amplifier. My role in the project:

- specified the requirements
- designed the high level architecture
- implemented driver, API
- integration (as slave component) with other existing diagnostic tools

The tool proved to be useful and usable, and after the prototype, several units of the tool have been commissioned and are in use by the hardware team.

Touchscreen Analyser

Project Manager, Cambridge Touch Technologies **2019**

This tool was aimed at diagnosing manifacturing defects of pressure sensing enabled touch panels. The scope of the project was to harness existing experiments and components in the company, and integrate them organically into a usable tool. The instrument analyses the electrodes of capacitive touch panels, and automatically generates easy to read reports containing physical measures and inferred features. My role in the project:

- designed the flow of operations, data format and structures, and system level architecture
- coded most of the software and the GUI
- designed and coded signal and data processing algorithms (feature extraction, classification)
- automated report generation (Latex)

Quick Http Messages

Individual Project, 5GIC **2018**

This project was a proof of concept to provide a barebone, simple playground to test ideas and allow quick prototyping in HTTP service based architectures (SbA), such as the 5G core network. The core idea was to implement a simple HTTP server over bare UDP, to minimize latency. The C++ source code for this project is available at `https://github.com/giuliol/quick-http-messages`. As one-man project, I designed and implemented the entire system. Additionally, I realized a simple automatic generator tool, able to parse 3GPP OpenAPI compliant YML definitions of components in the 5G SbA and generate stubs for their REST APIs.

Research & Publications

Igor Bisio, Fabio Lavagetto, Giulio Luzzati and Andrea Sciarrone, “A Novel Active Warden Technique for Image Steganography”, accepted IEEE GLOBECOM 2016.

I. Bisio, A. Fedeli, F. Lavagetto, G. Luzzati, M. Pastorino, A. Randazzo, and E. Tavanti, “Brain Stroke Detection by Microwave Imaging Systems: Preliminary Two-Dimensional Numerical Simulations”, submitted to 2016 IEEE International Conference on Imaging Systems and Techniques (IST 2016)

Igor Bisio, Alessandro Fedeli, Fabio Lavagetto, Giulio Luzzati, Matteo Pastorino, Andrea Randazzo, and Emanuele Tavanti, “Hemorrhagic Brain Stroke Detection by using Microwaves: Preliminary Two-dimensional Reconstructions”, IV Convegno Nazionale “Interazione tra Campi Elettromagnetici e Biosistemi”, Milano, 4-6 July 2016.

Igor Bisio, Fabio Lavagetto, Giulio Luzzati, “Cooperative Application Layer Joint Video Coding in the Internet of Remote Things”, submitted to the IEEE Internet of Things Journal.

Igor Bisio, Giulio Luzzati and Andrea Sciarrone, “Cell-ID Meter App: a Tester for Coverage Maps Localization Proofs in Forensic” Investigations, 7th IEEE International Workshop on Information Forensics and Security Rome, Italy, 16-19 November, 2015

Igor Bisio and Stefano Delucchi and Fabio Lavagetto and Giulio Luzzati and Mario Marchese, “Cooperative Application Layer Joint Coding and Rate Allocation Techniques for Video Transmissions over Satellite Channels through Smartphones”, accepted to IEEE ICC 2015 SAC - Satellite and Space Communications (ICC’15 (01) SAC6-SSC)

Igor Bisio, Fabio Lavagetto, Giulio Luzzati, Mario Marchese, “Smartphones Apps Implementing a Heuristic Joint Coding for Video Transmissions over Mobile Networks”, International Journal of Mobile Networks and Applications (MONET).

Igor Bisio, Aldo Grattarola, Fabio Lavagetto, Giulio Luzzati, Mario Marchese, “Application Layer Source-Channel Video Coding for Transmission with Smartphones over Satellite Channel”, Proc. The Sixth International Conference on Advances in Satellite and Space Communications (SPACOMM), February 23 - 27, 2014 - Nice, France.

Igor Bisio, Fabio Lavagetto, Giulio Luzzati, Mario Marchese, “Smartphones Apps Implementing a Heuristic Joint Coding for Video Transmissions over Mobile Networks”, 6th International Conference on Personal Satellite Services, July 2014, Genoa, Italy

Igor Bisio, Aldo Grattarola, Fabio Lavagetto, Giulio Luzzati, Mario Marchese, “Performance Evaluation of Application Layer Joint Coding for Video Transmission with Smartphones Over Terrestrial/Satellite Emergency Networks”, Proc. IEEE International Conference on Communications 2014, ICC 2014, 10 âĂŞ 14 June 2014, Sydney, Australia - Best Paper Award winner

Bisio, I.; Delfino, A.; Luzzati, G.; Lavagetto, F.; Marchese, M.; Fra, C.; Valla, M., “Opportunistic estimation of television audience through smartphones,” Performance Evaluation of Computer and Telecommunication Systems (SPECTS), 2012 International Symposium on , vol., no., pp.1,5, 8-11 July 2012