

Profile

My education

- 2012 M.Sc. in Telecommunication Engineering (thesis on audio fingerprinting)
- 2016 Ph.D. in Computational Intelligence

My tools and skills

- Software
 - Software architecture and development
 - Build systems
 - Unit testing and continuous integration
 - Embedded (mostly bare metal)
 - Favorite languages
 - C (simple rules, easy to establish coding standards, agnostic)
 - Python (fast prototyping, huge community)
- Linux OS, Yocto
- Computer networks and protocols
- Electronics, basics (i.e., not afraid to grab a scope to debug inter-ic communications)

My scientific background

- Statistics
- Information theory
- Signal processing (audio, signal)
- Mathematical optimization

Research Activity

- Application layer joint source/channel coding
 - Realized Android apps performing adaptive source/channel encoded video streams
 - Co-authored scientific publications
- TV channel detection via audio fingerprinting
 - C implementation of live TV audio stream fingerprint computation and matching
 - Ported fingerprint algorithm to iOS
 - Research and optimization of system parameters
 - Co-authored scientific publications
- Brain stroke detection via microwave imaging
 - State of the art survey
 - Implementation of glue code for data manipulation
 - Preliminary investigation on neural network detection (Google Tensorflow)
 - Co-authored scientific publications

Industrial Experience

Quick Http Messages, developed at 5GIC,.

- HTTP over UDP
- playground for SoA (RESTful API services)
- core messaging implemented
- initial version of automatic generator (from OpenAPI yml files)
- available at <https://github.com/giulio1/quick-http-messages>

Touchscreen analyser. Developed at CTT, 2019

- diagnosing manufacturing defects of pressure sensing enabled touch panels
- OTS VNA, custom serial operated switch board
- Impedance spectroscopy to find anomalies
- My contribution
 - Designed software and data architecture
 - Implemented most of the software
 - Designed data analysis algorithm and metrics to highlight anomalies
 - Automatic report generation
- prototype output validated against known dataset, flagged previously unknown defects.
- second iteration in design

Signal Injector for Pressure Sensors. Developed at CTT, 2019

- inject signal into amplifier boards, to isolate analog frontend and downstream
- maximally usable - a self contained box with easy to use web-app to control it
- My contribution
 - Contributed to requirements specifications
 - Designed functional architecture
 - Designed and implemented drivers, software and communication protocols
 - Integration (as slave component) with other existing diagnostic tools
- Very positive feedback, currently in use by the hardware team
- Second iteration under development

Human touch interaction model, Developed at CTT, ongoing

- Provide mathematical models for touch interactions (e.g., force profile as a function of time)
- Identify assumptions and applicability
- Gather experimental data
- Fit mathematical curves
- My contribution
 - Designed and realized acquisition tool (arduino + strain gauge + haptics)
 - Implemented firmware and software to “gamify” the experiment
 - Designed mathematical curves to fit the “average” force profiles
- Test machines are able to simulate realistic touches using parametrised mathematical models
- Design choices can now be strongly backed up by the study
- Experiment platform is generic and extensible, second study (effects of processing delay) has been commissioned and ongoing