

PERSONAL INFORMATION



Profile: Electrical Engineer and PhD specialized in Synchrophasor based Technologies. WAMS/WAMPAC Systems, Phasor Measurement Units (PMUs), Phasor Data Concentrators (PDCs).

Expertise Standards: IEC 60255-118-1-2018, IEEE C37.118-1, IEEE C37247-2019, IEC 61850 Series, IEC 61869 Series, IEC 61000 Series and others.

EXPERIENCE

Jan 2025 – Present **Senior Power Systems Engineer**

GE Vernova – Edinburgh, United Kingdom

- Engaged in the development of Hardware-in-the-Loop (HIL) testing environments, providing a validation platform for control strategies related to Virtual Power Plants, Energy Restoration Systems, and Active Network Management.

Apr 2024 – Jul 2024 **Visiting Scholar at UCSD (University of California, San Diego)**

University of California, San Diego – Mechanical and Aerospace Engineering Dep. (USA)

- Evaluating an alternative implementation of WAMS (Wide Area Monitoring System) based on a distributed implementation of PMUs, where the PMU estimation algorithm is run on Cloud. **Main Tools, Technologies, and Standards:** MSQUIC, libIEC61850, Docker, SynchroPMU, OpenPDC, C/C++, IEEE C37.118-2/1, IEEE C37247-2019, IEEE 61850 Series.
- Presently engaged in the implementation and performance evaluation of IEC-61850 Sampled Values over the QUIC protocol (SVoQ) as opposed to UDP (R-SV) in WAN networks. Assessing metrics such as delay, jitter, data loss, and congestion for benchmarking purposes.

Jan 2022 – Dec 2024 **Indra Italia - Electrical Engineering Consultant**

Indra Italia - Minsait, Rome (Italy)

- Implemented a virtual M-Class Phasor Measurement Unit on QEd Edge Device (developed by Gridspertise, an ENEL company). **Tools and Technologies:** Hexagon SDK, QuRT RTOS, Nanomessage (NNG), PROTOBUF, Docker and MATLAB. The firmware is written completely in C/C++.
- Developed and implemented a phasor/frequency estimation algorithm for protection purposes, to estimate electrical quantities in one cycle of nominal power frequency. The implementation has been deployed on a Qualcomm Hexagon cDSP to ensure real-time processing. **Main Tools, Technologies and Standards:** MATLAB, QuRT RTOS, RGDM ENEL Protection Standard.
- Engaged in the development of a standardized power system digital device which integrates the functionalities of a PMU, Power Quality Analyzer, and a Protection Measurements Estimator.
- Engaged in the troubleshooting and debug of a Wide Area Monitoring System with a capacity of 300 PMUs for TERN utility company.

EDUCATION

Nov 2021–Nov 2024 **PhD Program in Electrical Engineering - Applied Measurements**

Alma Mater Studiorum University of Bologna, School of Architecture and Engineering (Italy)

- Thesis:** Phasor Measurement Unit Implementation Across Embedded, Edge, and Cloud Environments for Modern Grid Monitoring Systems
- Implemented and evaluated an alternative architecture for distributed PMU based systems, based on Amazon Web Services (AWS). The project was presented at the 2022 International Conference on Applied Measurements for Power Systems. DOI: [10.1109/AMPS59207.2023.10297270](https://doi.org/10.1109/AMPS59207.2023.10297270)
- Implemented an Open-Source MATLAB-Based PMU Library for HIL Applications Compliant with IEC/IEEE 60255-118-1. The project was presented at the 2022 International Conference on Applied Measurements for Power Systems. DOI: [10.1109/AMPS55790.2022.9978837](https://doi.org/10.1109/AMPS55790.2022.9978837)

Sep 2018–Sep 2021 Master's degree in Electrical Energy Engineering

Alma Mater Studiorum University of Bologna, School of Architecture and Engineering (Italy)

- International student at Bologna University by being one of the 5 winners of the Italian MAECI scholarship (Ministry of Foreign Affairs and International Cooperation) in Algeria in the year of 2018.
- Courses: Electric Power Systems, Modelling and Computation of Electric and Magnetic Field, High Voltage Engineering, Electric Drives...

Sep 2014–Jul 2017 Bachelor's Degree in Electrical and Electronics Engineering

Institute of Electrical & Electronic Engineering M'Hamed Bouguerra University, Boumerdes (Algeria)

- Admitted in the National IEEE (INELEC) by ranking top in Batna province in Electrical Engineering High School branch.
- Courses: Computer Architecture, Digital Systems with VHDL, Power Electronics, Active Devices, Control Systems, Signal Processing and Communications...

PROJECT WORK

May 2022 SynchroPMU- An Open-Source PMU Library for Real-Time Applications

University of Bologna, PhD Program

- Implemented an Open-Source PMU Library compliant with IEC/IEEE 60255-118-1 based on the enhanced Iterative Interpolated-DFT Algorithm. The project was fully developed in ANSI C. The project was presented at the IEEE AMPS 2022 Conference.
DOI:[10.1109/AMPS55790.2022.9978837](https://doi.org/10.1109/AMPS55790.2022.9978837)
- The project is available on GitHub: <https://github.com/chemsallioua/SynchroPMU>

Jan 2021 Phasor Measurement Unit based on Raspberry PI V.4

University of Bologna, Master's degree thesis

- Designed, implemented, and tested a PMU built based on the Raspberry Pi 4 that delivers 1 Frame/s.
- Developed an estimation algorithm for synchrophasor, frequency and ROCOF which lead to the full compliance of the system in terms of performance with the International Standard IEEE 60255-118-1:2018 Steady-State measurement requirements.

Feb 2020 TUBELogic, an industrial quality control and data collection system for tube deburring

Challenge Based Innovation

- Designed and Implemented an innovative solution aimed to collect in-field data about the tube deburring brushes status through the analysis of tube's data collected by vibration sensors. The system was prototyped with the Arduino environment. Tests have been run in the field for performance verification.
- The project have been patented by SIT (Società Italiana Tecnospazzole):
Link: <https://patents.google.com/patent/US20220219276A1/en>

INTERNSHIPS

Oct 2019 – Feb 2020 Challenge Based Innovation

IdeaSquare CERN, Geneva (Switzerland)

- OPER.CBI 2019-2020 Challenge Based Innovation is a 6 months program where students of the University of Bologna, develop projects that solve complex engineering problems, with the help of the technology from the CERN (European Nuclear Research Center).
- Designed, Developed and Implemented an innovative technological solution based on electronic sensors and data collection.
- The project has been patented by the company.

May 2019 – Oct 2019 Switchboard Certifications Internship

ABB SACE, Garbagnate Monastero – Lecco (Italy)

- Assisted in laboratory tests and performed a variety of technology/engineering assignments in the R&D department related to the ABB switchboards by using the mechanical design software CATIA V5.
- Interfaced with the entities UL and ACAE LOVAG and handled the certifications of the switchboards.
- Helped in the creation of a ONE PAGE handy list of all the tests performed on the Switchboard that has been further certified by ACAE LOVAG.

Aug 2018 **Summer internship – Wireline Segment**

Schlumberger Oil&Gas, Hassi Messaoud (Algeria)

- Selected as one of the 9 intern summer trainees out of all the 200 Masters students in the institute of Electrical and Electronics Engineering of Boumerdes.
- Managed to design and present a help file related to the oven used by the engineers to heat-check the tools by creating a set of instructions which helped to reduce the time of the task by 50%, (from 14 hours to 7), and 1 worker rather than 3.
- Performed a presentation about the company standards for the wireline depth control and suggested 3 alternative technical solutions to obtain more accurate measurements.

EXTRACURRICULARS

Sep 2015 - Present **Member of “Thala n Thagouth” Association**

Thala n Thagouth, Ain Yagout

- Member and cultural activist in the association, which aims to conserve the indigenous North African culture, the “Amazigh” culture.

LANGUAGES

TECHNICAL SKILLS

- Programming Languages: Python, C/C++, Java, QML
- RTOS, multithreading, real-time systems
- Linux Distributions
- Networking and Communication Protocols
- Digital Signal Processing
- Simulations in MATLAB/Simulink
- Frameworks: Snapcraft, Docker, AWS, Qt
- Supervised Machine Learning
- Microsoft Office



Chemseddine Allioua
15/05/2025

