J. FELICIEN IHIRWE

Software engineer & Low-code engineering

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BIO

I'm an industrial Ph.D. candidate in the Department of Information Engineering, Computer Science, and Mathematics (DISIM) at the University of L'Aquila hosted by Intecs Solutions S.p.A's Innovation Technology Service research lab in Pisa-Italy. I graduated from Carnegie Mellon University with a Master's degree in Electrical and Computer Engineering. My research interest lies in Low-code Engineering (LCE), Software Engineering, and the Internet of Things (IoT) at the Edge/Fog/Cloud. Low-code Engineering integrates the theoretical and technical research in Low-code Development Platforms, Model-Driven Engineering, Cloud Computing, and Machine Learning to more sophisticated domains such as IoT, Industrial automation, Cyber-physical systems and Recommender systems. My current work focuses on developing a robust domain-specific language for the design and analysis of industrial complex IoT systems by employing Low-code Engineering concepts.

EDUCATION

P.h.D in Information Science and Engineering

Nov 2019 – Ongoing — **University of L'Aquila**

Interest: *Low-code engineering & Domain-specific languages & IoT*

M.Sc. in Electrical and Computer Engineering

July 2017 – June 2019 — **Carnegie Mellon University**

Interest: *Software engineering & Machine Learning*

B.Sc. in Electronics and Telecommunication Engineering

Oct 2012 – June 2016 — **College of Science and Technology-University of Rwanda**

Interest: *Embedded Systems*

RESEARCH EXPERIENCE

PUBLISHED PAPERS

2021

- **"Cloud-based modeling in IoT domain: a survey, open challenges and opportunities"**. **Felicien Ihirwe** , Arsene Indamutsa, Davide Di Ruscio, Silvia Mazzini, and Alfonso Pierantonio. *In the Proceedings of 2021 ACM/IEEE International Conference on Model Driven Engineering Languages and Systems Companion (MODELS 2021)*. October 2021 DOI: 10.1109/MODELS-C53483.2021.00018.
- **"A domain specific modeling and analysis environment for complex IoT applications"**. **Felicien Ihirwe** , Davide Di Ruscio, Silvia Mazzini, and Alfonso Pierantonio. *In the 7th Italian Conference on ICT for Smart Cities And Communities (I-CiTies'21)*. September 2021. [Online]
- **"Towards an MQTT5 geo-location extension for location-aware applications"**. **Felicien Ihirwe** , Giovanni Iovino, and Davide Di Ruscio. **In the 44th IEEE International Conference on Telecommunications and Signal Processing (TSP'21)**. DOI: 10.1109/TSP52935.2021.9522590. July 2021 [Online]
- **"Towards a modeling and analysis environment for industrial IoT systems"**. **Felicien Ihirwe** , Davide Di Ruscio, Silvia Mazzini, and Alfonso Pierantonio. *In the International workshop on MDE for Smart IoT Systems co-located with Software Technologies: Applications and Foundations (MESS@STAF21) conferences*. June 2021. [Online - DOI]
- **"Model-based Analysis Support for Dependable Complex Systems in CHESS"**. Alberto Debiasi, **Felicien Ihirwe** , Pierluigi Pierini, Silvia Mazzini, and Stefano Tonetta. *In Proceedings of the 9th International Conference on Model-Driven Engineering and Software Development - MODELSWARD'21*. ISBN 978-989-758-487-9; ISSN 2184-4348, pages 262-269. DOI: 10.5220/0010269702620269. February 2021 [Online]

2020

- **"Low-code Engineering for the Internet of things: A state of research"**. **Felicien Ihirwe** , Davide Di Ruscio, Silvia Mazzini, Pierluigi Pierini, and Alfonso Pierantonio. *In Proceedings of the 23rd ACM/IEEE International Conference on Model Driven Engineering Languages and Systems: Companion Proceedings (MODELS'20)*. Article No.: 74 Pages 1–8 DOI:10.1145/3417990.3420208. October 2020 [Online]

TEACHING

Carnegie Mellon University

Fall 2018 — Kigali-Rwanda

- **Graduate Teaching Assistant:** 04-330 Foundations of Software Engineering and Problem Solving.

July-Aug 2018, 2019 and 2021 — Kigali-Rwanda

- **Graduate Teaching Assistant:** Introduction to Linux-Java programming orientation course.

The African Centre of Excellence in Data Science (ACEDS)

Fall 2019 and 2020 — Remote

- **Graduate Teaching Assistant:** DSC6231 Computer Systems and Data Analytics.

High school teaching (ACEC)

February 2012 - June 2015 — Nyabihu-Rwanda (Part-time)

- **Teacher:** Mathematics and Physics for Advanced level studies.

INVITED REVIEW

- IET Software journal. **External reviewer**
- Mining Software Repositories. **Shadow Program Committee (MSR'21)**

VOLUNTEER

- **Student Volunteer:** The 49th ACM SIGPLAN Symposium on Principles of Programming Languages (POPL 2022). Sun 16 - Sat 22 January 2022
- **Student Volunteer:** The 36th IEEE/ACM Int. Conf. on Automated Software Engineering (ASE 2021). Sun 14 - Sat 20 November 2021
- **Student Volunteer:** ACM / IEEE 24rd Int. Conf. on Model Driven Engineering Languages and Systems (MODELS'21) 10-15 October 2021
- **Student Volunteer:** 25th ACM International Systems and Software Product Line Conference (SPLC 2021) Sept 6-11, 2021
- **Vice-president:** Energy and embedded system community - Carnegie Mellon university-Africa Dec 2017-Feb 2019

SPEAKER AT CONFERENCES

- *"Cloud-based modeling in IoT domain: a survey, open challenges and opportunities"* at the ACM/IEEE 24rd Intl. Conf. on Model Driven Engineering Languages and Systems (MODELS'21) **(Speaker)** October 10 - 15, 2021
- *"A domain specific modeling and analysis environment for complex IoT applications" 7th"* at the Italian Conference on ICT for Smart Cities and Communities (I-CITIES 2021) **(Speaker)** 22-24 September, 2021
- *"Towards an MQTT5 geo-location extension for location-aware applications"* at the 44th IEEE International Conference on Telecommunications and Signal Processing (TSP'21) **(Speaker)** July 26-28, 2021.
- *"Towards a modeling and analysis environment for industrial IoT systems"* at Software Technologies: Applications and Foundations conferences (MESS@STAF21'21) **(Speaker)** 21-25 June 2021.
- *"Low-code Engineering for the Internet of things: A state of research"* at the ACM/IEEE 23rd Intl. Conf. on Model Driven Engineering Languages and Systems (MODELS'20) **(Speaker)** Oct 16-23, 2020

PROFESSIONAL EXPERIENCE

Research Assistant

Intecs Solutions S.p.A

December 2019-Current — Pisa,Italy

- Computer Science applications in LowCode Engineering with Model-Driven Software Engineering practices for Industrial IoT systems.
- Working on CHESSIoT modeling and analysis environment
- Model-based system's failure logic analysis and real-time schedulability analysis for IIoT systems
- Platform-specific code generation. **Technologies**: Java, UML/SysML/MARTE, Acceleo, Qvto, Xtext, ETL.

Technical Consultant

BIRGER.

June 2019-November 2019 — Kigali, Rwanda

- BIRGER. is one of the leading professional IT services firm in the Indian Ocean Region, covering 9 countries.

- I was in charge of Consulting services in the area of Technology, Security and Resiliency for Rwanda and towards the East Africa region.

Software Engineer
WYS ltd

Jan 2019 - June 2019 | Kigali, Rwanda

- Contributed to the software development lifecycle by adopting agile principles until effective deployment.
- Software development using Java-based SpringBoot, JPA, Security, Thymlearf, JQuery and Bootstrap.
- Worked on an integration framework with different multipurpose consumer services.

Co-Founder & Developer
TaagMind ltd

September 2018 - October 2020 | Kigali, Rwanda

- TaagMind aim is to offer Augmented & Virtual reality (AR&VR) experience to client.
- Technologies used: Unity3D, Node.Js, React Frameworks, SparkAR Studio.

Data Scientist (Internship)
Rwanda Revenue Authority

May 2018 – September 2018 | Kigali, Rwanda

- Worked on Electronic Billing Machine (EBM) data to improve the VAT tax payment compliance and service quality.
- Developed a Machine Learning model to predict non-reporting EBM machine.

Administrative Support Officer
Carnegie Mellon University - Africa

Jan 2018 – May 2018 | Kigali, Rwanda

- General office support for various administrative functions of the organization.

Electronics & Repair Engineer
BBOXX Capital

May 2016 – August 2017 | Kigali, Rwanda

- Efficiently provided a great working commitment to the company product refurbishment processes, unshipping, product quality check and deployment to the market.
- Close collaboration with the ongoing product design team to improve client's satisfactions.

IT & Automation officer (Internship)
BRALIRWA - Part of Heineken

May 2015 – August 2015 | Kigali, Rwanda

- Contributed to the design and implementation of new system wiring optimization of brewery expansion.
- Effectively identified and fixed faults which arose in company electrical and automotive network.

PROJECTS

Lowcomote (EU H2020-ITN n. 813884)

November 2019-Current | Pisa, Italy

Lowcomote aims to train a generation of professionals in the design, development and operation of new LCDPs, that overcome the limitations above, by being scalable (i.e., supporting the development of large-scale applications, and using artefacts coming from a large number of users), open (i.e., based on interoperable and exchangeable programming models and standards), and heterogeneous (i.e., able to integrate with models coming from different engineering disciplines). These scientists will drive the upgrade of the current landscape of Low-Code Development Platforms to Low-Code Engineering Platforms (LCEPs).

TECHNICAL SKILLS[*:FAMILIAR]

Programming Language
Java (SpringMVC, SpringBoot), Python (Flask), JS*, Node* PL/SQL, C++/C, Assembly*, MATLAB, UML, Xtext, Acceleo, Xtend*/Qvto*

Database
MySQL, Postgres, MongoDB*

Front-end
JQuery, BootStrap, Thymeleaf, AngularJS*

Source Control
Git, SVN

OS
MacOS, Linux (Ubuntu, Kali), Windows

Linux
Linux/Bash Scripting

Deployment
Docker(DockerFile, Docker Compose)

Data Science
Python/Matlab, Machine Learning, Deep learning

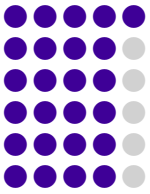
Editor
Eclipse, VS Code, Sublime, Vi

Languages
English, French, Italian*, Kinyarwanda, Kiswahili*

Driving Licence
B

INTEREST

Research Scientist
Teaching SWE
Team Lead
Software Development
Software Architecture
Machine learning



ACADEMIC REFERENCES

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