

Curriculum vitae

Civil status



Rita ZGHEIB

Date of birth: 21/03/1991
Nationality: French/Lebanese (UAE Golden Visa Holder)
Family situation: Married
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Curent position : Assistant Professor
Canadian University Dubai, Dubai, UAE

- Education:**

Degree	Discipline	Institution	Year
Bachelor	Computer Science	Lebanese University – Faculty of Science	2012
Master	Computer Science	Toulouse III Paul Sabatier University	2014
Doctorate	Computer Science – Artificial Intelligence	Toulouse III Paul Sabatier University Title : SeMoM : Semantic Middleware for IoT Healthcare Applications Directors: Pr. Rémi BASTIDE and Dr. Emmanuel CONCHON	2017

- Academic Experience:**

	Institution	Rank	Title	Tenure	Status (Full-Time or Part Time)
a.	Lebanese American University	Assistant Professor -	Coordinator, Ms. in Data Analytics	Sep 2026 (Present)	Full-Time
b.	Canadian University Dubai, Dubai, UAE	Assistant Professor - Research Faculty	Coordinator, Computer Science Program	2019-2026	Full-Time
c.	IUT de Bayonne, Anglet, France	Lecturer	Lecturer	2018-2019	Full-Time
d.	INU Champollion / ISIS Engineering school, Castres, France	Lecturer	Lecturer	2017-2018	Full-Time
e.	INU Champollion / ISIS Engineering school, Castres, France	Contractual PhD Student	Teaching Assistant	2014-2017	Full-Time

- Non-Academic Experience:**

	Company	Title	Job Profile	Tenure	Status (Full-Time or Part Time)
a.	Airas ME,	Analyst/ Programmer	Design and implementation of extensible application modules for Insurance companies.	Sept. 2011-Jul. 2012	Part-Time

- **Teaching Skills:**

Courses	Algorithms, System Architecture and Design, Software engineering, JAVA, Python, Database Design, C++, introduction to networking, algorithmic, Architecture of web applications, and object-oriented programming.
Public	Bachelor, Master, and, Engineers

- **Research Skills:**

Topics	Machine Learning, Disease and epidemic detection, Internet of Things (IoT), middleware architecture, ontologies, healthcare applications, semantic reasoning, AI, Ambient Assisted Living, smart cities, software engineering
Publications	> 20 Publications (On going Q1/Q2 journals: 1 accepted, 2 submitted, 8 in progress)
Master and Graduation Projects Supervision	2 tutored Master's thesis and 6 Graduation Projects (Bachelor)
International collaborations	2 international stays (Rome/Italy – Oslo/Norway - France)

- **Research Projects**

Category	Project Title	Status/Publication	Collaboration
Research Projects	AI for Doctor-patient communication	Work in progress: 3 papers have been submitted to journals	In collaboration with the Public Health, and Communication Departments at CUD
	AI in Psychology	Work in progress, unpublished	In collaboration with the Psychology Department at CUD
	AI for EcoFarms: Enhancing Agriculture and Air Quality with Intelligent Systems	Paper 1: https://link.springer.com/chapter/10.1007/978-3-031-81369-6_8 Paper 2: https://ieeexplore.ieee.org/abstract/document/10638296	In collaboration with the Public Health School at CUD
	AI Solution for Crime Detection	Accepted -- to appear.	Independent/ Graduation Project
Research Projects with Impact	A Secure AI-Driven Solution for Enhancing Claim Management Systems in Healthcare	Implemented in local hospitals in Dubai – Accepted to be published	Collaboration with a local insurance company

International Collaboration	COVID-19 Detection in collaboration with Al Zahra hospital in Dubai	Paper 1: https://ieeexplore.ieee.org/abstract/document/9615883 Paper 2: https://link.springer.com/chapter/10.1007/978-3-030-84529-2_52	In collaboration with the University of Toulouse, and Al Zahra Hospital in Dubai
	Knowledge Graph for Medical Diagnosis	https://www.sciencedirect.com/science/article/abs/pii/B9780323917735000133 1 more paper to be submitted	ENEA Research Centre Rome, IASI-CNR, Rome, Italy

• Professional Development Activities

Type	Description
Course	Safeguarding Young People Colleges and Universities
Course	AWS Cloud Practitioner
Workshop	Academic Integrity & Plagiarism
Course	Academic Integrity, Cheating and Plagiarism
Panel Discussion	Gulf News EduFair
ABET Workshop	ABET - Fundamentals of Program Assessment Workshop
Course	IBM – Data Science (Coursera)
Course	Google AI Facilitator

• Current Membership in Professional Organizations:

- IEEE/IEEE Women in Engineering

• Service Activities (*Faculty contribution to services within and outside of the institution*):

- Program Coordinator for Computer Science and Software Design Programs, Canadian University Dubai, Dubai, UAE, September 2020 – December 2025.
- Research Group Lead IoT and AI Group. Canadian University Dubai, Dubai.
- Chair, Outreach Committee, School of Engineering, Applied Sciences and Technology, Canadian University Dubai, UAE, 2021-2022.
- Library Representative, School of Engineering, Applied Sciences and Technology, Canadian University Dubai.
- AWS Academy: Primary CPOC (Central Point-of-Contact) for Canadian University In Dubai, 2020-present.

LIST OF PUBLICATIONS

- [1] **Zgheib, R.**, El Nagggar, A., Kermani Kolankeh, A., & Takshe, A. A. (2026). Toward Trustworthy AI for Autism Spectrum Disorder: A Systematic Review of Multimodal Systems, Knowledge Representation, and Clinical Integration. *Information*, 17(8), 802. <https://doi.org/10.3390/info17080802>
- [2] **Zgheib, R.**, Sadek, Y. R., Sherif, M., Aditiyah, J., & Abdelmksoud, M. (2026). Secure AI-Driven Solution for Enhancing Claim Management Systems in Healthcare. In *BIOSTEC* (3) (pp. 223-234).
- [3] Abualrous, R.; Zouzou, H.; **Zgheib, R.**; Hasan, A.; Hijazi, B.; Kermani, A. Fairness-Aware Intelligent Reinforcement (FAIR): An AI-Powered Hospital Scheduling Framework. *Information* 2025, 16, 1039. <https://doi.org/10.3390/info16121039>
- [4] Abu Alrous, **R.**, **Zgheib, R.**, Mashnouq, A., Menon, P., Al Tamimi, R., & Takshe, A. (2024). Smart Air-Quality Detection Using Regression Models. *ICICS 2024 (IEEE)*.
- [5] Suleiman, S., Elsenousy, Y., El Nagggar, R., Ramadan, M., **Zgheib, R.**, & Kamalov, F. (2024). Ensemble System for Cybersecurity Threat Detection. *ISBM 2024 (Springer Proceedings)*.
- [6] Kanaparthi, Y., Shaikh, A. K., Khan, I. I., & **Zgheib, R.** (2024). Optimizing Agricultural Practices Through Integrated IoT and ML Solutions. *AI4S 2024 (Springer)*.

- [1] Hijazi, B., Al-Daker, Y., Mahmoud, Y., Ismail, H., **Zgheib, R.**, & Kamalov, F. (2024). The Effect of Imbalanced Data on Machine Learning Algorithms. *ICICCT 2024 (Springer - Lecture Notes in Networks and Systems)*.
- [2] Butt, A. H., Khan, Z., Khan, A., Ghazanfar, H., **Zgheib, R.**, & Kamalov, F. (2024). Performance of Sampling Methods on Imbalanced Data: Comparative Analysis. *ASET 2024 (IEEE)*.
- [3] Adithya, J., Mortezaei, P., Aljawawde, K., Mohamed, M., **Zgheib, R.**, & Mohamed, T. (2024). Automated Crime Detection in CCTV Footage Using Machine Learning. *ICCIDA 2024 (Springer, Lecture Notes on Data Engineering and Communications Technologies)*.
- [4] **Zgheib, R.**, Chahbandarian, G., Kamalov, F., El Messiry, H., & Al-Gindy, A. (2023). Towards an ML-based Semantic IoT for Pandemic Management: A Survey of Enabling Technologies for COVID-19. *Neurocomputing Journal (Q1)*.
- [5] Al-Jaghoub, J. N., Jibreel, N. M., Maleki, F., Aljohar, J. A. J., Fakhoury, F. N., Satria, G. B., & Zgheib, R. (2023). Deep Learning for Preventing Botnet Attacks on IoT. *NEW2AN 2023 (Springer)*.
- [6] Al Mehairi, A., **Zgheib, R.**, & Abdellatif, T. M. (2022). Cyber Security Strategies While Safeguarding Information Systems in Public/Private Sectors. *EGETC 2022 (Springer)*.
- [7] **Zgheib, R.**, Nicola, A. D., & Taglino, F. (2022). Toward a Knowledge Graph for Medical Diagnosis: Issues and Usage Scenarios. In *Semantic Models in IoT and eHealth Applications (Book Chapter)*.
- [8] Kamalov, F., Nazir, A., Safaraliev, M., Cherukuri, A. K., & **Zgheib, R.** (2021). Comparative Analysis of Activation Functions in Neural Networks. *ICECS 2021, 28th IEEE International Conference on Electronics, Circuits, and Systems*.
- [9] **Zgheib, R.**, Chahbandarian, G., Kamalov, F., & El Labban, O. (2021). Neural Networks Architecture for COVID-19 Early Detection. *ISNCC 2021, IEEE International Symposium on Networks, Computers and Communications*.
- [10] **Zgheib, Rita**, Firuz Kamalov, Ghazar Chahbandarian, and Osman El Labban. "Diagnosing COVID-19 on Limited Data: A Comparative Study of Machine Learning Methods." In *International Conference on Intelligent Computing*, pp. 616-627. Springer, Cham, 2021.
- [11] Kamalov, Firuz, Sherif Moussa, **Rita Zgheib**, and Omar Mashaal. "Feature selection for intrusion detection systems." In *2020 13th International Symposium on Computational Intelligence and Design (ISCID)*, pp. 265-269. IEEE, 2020.
- [12] **Rita Zgheib**, Stein kristiansen, Emmanuel Conchon, Thomas Plageman, Vera Goebel, and Rémi Bastide. "A Scalable Semantic framework for IoT healthcare applications". Springer, *J Ambient Intell Human Comput* (2020)
- [13] **Zgheib Rita**, Emmanuel Conchon, and Rémi Bastide. "Semantic Middleware Architectures for IoT Healthcare Applications." *Enhanced Living Environments*. Springer, Cham, 2019. 263-294.
- [14] **Zgheib Rita**, DeNicola Antonio, Villani MariaLuisa, Conchon Emmanuel, Bastide Rémi. "A Flexible Architecture for Cognitive Sensing of Activities in Ambient Assisted Living". *WETICE 2017 (Enabling Technologies: Infrastructure for Collaborative Enterprises) IEEE 26th International Conference*. (pièce jointe) <http://wetice.ue.poznan.pl/>
- [15] **Zgheib Rita**, Conchon Emmanuel, and Bastide Rémi. "Engineering IoT Healthcare Applications: Towards a Semantic Data Driven Sustainable Architecture." *eHealth 360°*. Springer International Publishing, 2017. 407-418. (pièce jointe) <http://aal-iot.org/2016/show/home>
- [16] Faux, Francis, Rémi Bastide, Nathalie Souf, and **Rita Zgheib**. "Smartphone-Based Collaborative System for Wounds Tracking." *8th International Conference on e-Health, Telemedicine and Social Medicine (eTELEMED 2016)*, colocated with other events part of DigitalWorld 2016. <https://www.iaria.org/conferences2016/eTELEMED16.html>
- [17] **Zgheib Rita**, Bastide Rémi, and Conchon Emmanuel. "A Semantic Web-of-Things Architecture for Monitoring the Risk of Bedsores." *Computational Science and Computational Intelligence (CSCI), 2015 International Conference on*. IEEE, 2015. <http://americancse.org/events/csci2015>

Language skills

English :	Fluent Professional working proficiency	Arabic:	Native or bilingual proficiency.
French :	Fluent and professional proficiency		

DOCTORAL RESEARCH

The world population is rapidly aging, according to the WHO statistics, the number of people aged 65 and over will exceed 15% of the global population by 2050. As the global population ages, the demand for end-of-life care will continue increasing over the years. Elderly desire is staying in their own homes as long as it is possible and safe. To this end, steps must be taken to provide them with the necessary assistance, ensured by exploiting new technologies.

The combination of assisted living spaces and healthcare applications has been found to provide safe, quality care in the home thanks to intelligent sensors and the Internet of Things. These smart objects are deployed on a smart space in order to gather real-time information that can be treated, recorded and correlated to infer new data faster and more accurately.

In the context of home care applications, Healthcare applications that rely on connected objects today, focus on data and clinical validation and do not take into account how these data are collected. That means data is becoming proprietary for each application, moreover there is no good practices and software engineering methods for developing interoperable and flexible environments based on inter-connected objects (ICO).

In my thesis, I have treated the following **scientific challenges**:

- The heterogeneity of physical sensors and various components of a system based on smart connected objects;
- Semantic interoperability of physical sensors;
- End-to-end system interoperability;
- The specificity of the health domain and healthcare applications based on IoT;
- The difficulty of developing healthcare applications based on IoT;
- Detection of the risk of bedsores for elderly and the detection of their activities of daily living

Concerning heterogeneity and integration challenges, our **main contribution** is an ontology-based IoT architecture implementing the semantic web of things principles. This approach allows sharing of sensors observations, contextualization of data and reusability of knowledge and processed information. Specific contributions include:

- Design of the Cognitive Semantic Sensor Network ontology (CoSSN) ontology: CoSSN aims at overcoming the semantic interoperability challenges introduced by the variety of sensors potentially used. It also aims at describing expert knowledge related to a specific domain.
- Design and implementation of SeMoM: SeMoM is a flexible IoT architecture built on top of CoSSN ontology. It relies on a message-oriented middleware (MoM) following the publish/subscribe paradigm for a loosely coupled communication between system components that can flexibly exchange semantic observation data.

From the applicative perspective, we focus on healthcare applications. Indeed, specific approaches and individual prototypes are preeminent solutions in healthcare which straighten the need for an interoperable solution especially for patients with multiple affections. With respect to these challenges, we elaborated two case studies 1) bedsores risk detection and 2) Activities of Daily Living (ADL) detection as follows:

- We developed extensions of CoSSN to describe each domain concepts, and we developed specific applications through SeMoM implementing expert knowledge rules and assessments of bedsores and human activities.
- We implemented and evaluated the SeMoM framework in order to provide a proof of concept of our approach. Two experimentations have been realized for that target. The first is based on the deployment of a system targeting the detection of ADL activities in a real smart platform. The other one is based on ADLSim, a simulator of activities for ambient assisted living that can generate a massive amount of data related to the activities of a monitored person. The case studies were deployed and tested in an experimental platform at the ISIS engineering school in Castres, the Connected Health Lab (CHL).

International cooperations during PhD

During my thesis, I was able to invest in two international collaborations through two doctoral stays in Italy at the ENEA Research Center and in Norway at the University of Oslo. The fruit of the collaboration with ENEA was a publication in the WETICE conference [1]. Another collaboration with the University of Oslo has been established, the resulted journal paper has been published in Springer, J Ambient Intell Human Comput (2020).

Date	Host Lab	Contact	Experience
09-30 Oct. 2016	ENEA Rome, Italy	Dr. Antonio DeNicola	This collaboration led to the proposal of the ontology CoSSN in a paper published in WETICE 2017 (CORE B)
23-30 Apr. 2020	University of Oslo	Pr. Thomas Plagemann	This collaboration took place within the COST IC 1303 AAPELE European project and enabled the pooling of expertise in activity detection to produce a new contribution in the semantic middleware and disease/Epidemic detection.
Jan 2021 – to date	ENEA/ CNRS Italy	Dr. Antonio DeNicola	This collaboration led to the one publication as a book chapter about the knowledge graphs and ontologies proposed for healthcare and COVID-19. An journal paper is under process