Clovis A. **OUEDRAOGO**

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PhD student in Computer Science

Research interests. In my Ph.D. research, I consider **mission-critical applications** that communicate through Distributed IoT platforms. Much of the work I do involves thinking about problems caused by the Platform regarding application QoS requirements. I was motivated to conduct this doctoral research due to my passion for intelligent systems, and I am building a **autonomous control system** to sustain QoS for Cloud services. I am interested in varies approaches genetic algorithm and artificial neural networks.

🎓 Education

Since 2018	**Doctor of Philosophy** in Computer Science And Telecommunications, *INSA Toulouse* Laboratory for Analysis and Architecture of Systems (LAAS-CNRS) *Advisors : Prof. Chassot Christophe , Dr. Medjiah Samir and Dr. Drira Khalil*
2017	**Master of Science**, *INSA Toulouse*, France Majors in IoT & Big Data | **GPA** : 4.45/5.0 | **Rank** : N/A *Advisor : Prof. Chassot Christophe*
2016	**Master of Science in Engineering**, *Cadi Ayyad University*, Asfi, Morocco Majors in Computer Systems & Cloud Computing | **GPA** : 3.80/5.0 | **Rank** : 5/36 *Advisor : Prof. Zyane Abdellah*
2014	**Bachelor of Science**, *Hassan 1st University*, Settat, Morocco Majors in Signal processing & Computer network | **GPA** : 3.65/5.0 | **Rank** : 4/31 *Advisor : Dr. Abdelmajid Hajami*
2013	**Associate degree**, *Sidi Mohamed Ben Abdellah University*, Fez, Morocco Majors in Computer Science & Mathematics | **GPA** : 3.80/5.0 | **Rank** : 2/26 *Advisor : Prof. Jamal Belkadid*
2011	**Baccalauréat technologique**, *Technical High School*, Ouagadougou, Burkina-Faso. Majors in Electronic | **GPA** : 3.23/5.0 | **Rank** : 1/58

☰ Skills

Programming Skills :	**Java**, Matlab, LATEX, Python, R, PHP, SQL, Bash (Unix shell), asm, Git.
Computer Network :	NFV, SDN, IPv4/6, routing protocols, DNS, 3G, 4G, 5G, LoRaWAN/Sigfox
Internet of Things :	hardware engineering (CAD), energy recovery/transfer, data transport protocols (MQTT/HTTP/CoAP), cloud data storage and processing (Logstash/Elasticsearch), data visualization (Kibana/Grafana), UI design.
Problem solving :	**Abstraction**, Brainstorming, Root cause analysis, PDCA/TRIZ methods, Divide and conquer. [certificated : **Divide and Conquer, Sorting and Searching, and Randomized Algorithms** (Tim Roughgarden) by Stanford University on Coursera]
Artificial intelligence :	*master in* **evolutionary algorithms, search and optimization algorithms**. *familiar with* multi-objective optimization theory. *familiar with* most statistical machine learning algorithms/techniques. [certificated : **Machine Learning** (Andrew Ng) by Stanford University on Coursera]

</> Work Experiences

Current
Sep 2017
Part-time Lecturer, **INSA Toulouse**, France

In different courses related to Software-Defined Communication Infrastructure : Concepts and Software Techniques Associated with Network Functions Virtualization (and Networks Programmability) ; C and networks programming ; 5th year students projects tutor.

`C` `SDN` `NFV` `DevOps` `Openstack`

Fev 2018
Sep 2017
Research Assistant, **CNRS**, France

Development of a test-bed and experimentation on the dynamic management of quality of service in IoT platforms *leading to a scientific publication* "A Modular Framework for Dynamic QoS Management at the Middleware Level of the IoT : Application to a OneM2M Compliant IoT Platform" published in IEEE ICC 2018.

`Java` `Eclipse OM2M` `QoS` `IoT`

>_ Projects

Aug 2019
May 2019
Cognitive SLOs Management in IoT Platforms, LAAS-CNRS, Python

> *System modelization* by extending the VNF with the Application Network Function concept.
> *Problem Mathematical Formulation* by specifying the problem state, the available resources, the combinatorial constraints on their use and the criteria to be met to solve the problem.
> Implementation of *constrained optimization solution* based on Genetic algorithms.
> *Write a paper* "A Cost-Effective Approach for End-to-End QoS Management in NFV-enabled IoT Platforms", IEEE IoT Journal (Under Review).
> :github.com/couedrao/QoS4NIP

`AI` `QoS` `Data-driven` `Multi-objective Optimization` `Evolutionary Algorithm`

Jun 2018
Apr 2018
A Prototype for Dynamic Provisioning of VNF in IoT, LAAS-CNRS, Python/Java

> *Wildfire Surveillance and Monitoring System* which implements an automatic (Esper) wildfire surveillance and monitoring use case. It enables early fire spotting by : monitoring temperature over the forest using and detecting suspicious smoke with surveillance cameras.
> :github.com/couedrao/smoke_recognition : github.com/couedrao/netsoft_gUi
> *Software Defined IoT platform prototype* that uses NFV (OpenBaton + Docker), SDN (Floodlight + Banana Pi routers with OVS as SDN switches) to handle and manage floating QoS in dynamic and demanding contexts such as IoT systems.
> Prototype presented at IEEE NETSOFT Conference, 2018, Canada.

`Smoke Recognition` `Logistic Regression` `Classification` `NFV/SDN`

Aug 2017
Mar 2017
IoT Platforms QoS Management Mechanisms development, INSA Toulouse, Master Thesis

> *Design an architecture* for Seamless integration in the oneM2M-compliant OM2M.
> *Designed and Implemented* in JAVA five OSGi Bundles acting on the application traffic (HTTP, CoAP, MQTT requests and responses) : Adapter, Classifier, Dropper, Shaper, and Scheduler.
> : github.com/couedrao/iot_qos

`oneM2M` `OM2M` `OSGi` `Design pattern` `Network scheduling algorithms`

Jan 2017
Oct 2016
Member of project team : IoTracking, INSA Toulouse, TypeScript/C/C++

> Responsible for the LoRa communications in the project including radio planning on the lake Lèran, choice / specification and configuration of IoT Devices (Sodaq One) and LoRa Gateways (ChisteraPi + Raspberry).
> Project delivered to "Club de Voile des Rives de Léran"
> : IoTracking-Client IoTracking-Server IoTracking-Gateway IoTracking-Device

`Teamwork` `IoT` `LoRa` `IoT Gateway` `IoT Server` `Client UI` `TypeScript` `C`

Aug 2016 Apr 2016	**JAVA Engineer Internship, R&D**, LAAS-CNRS (Toulouse), France ⟩ Follow the standard development lifecycle and write Java code to standards. ⟩ Contribute to design of the architecture and the development of embedded QoS management mechanisms in IoT Platforms. ⟩ Design, develop, test, deploy and maintain embedded QoS management mechanisms. ⟩ Participate in the IoT Days in Toulouse Java Development Lifecycle Java performance optimization Scalability Availability

🔨 Grants & Awards

2018 – 2021	CNRS PhD scholarship Funded by Continental Digital Services France.
2011 – 2016	Outstanding scholarship of the Government of Morocco.
2011 – 2016	Outstanding scholarship of the Government of Burkina-Faso.

🔤 Languages

French :	Reading	● ● ● ● ●	English :	Reading	● ● ● ● ●		
	Listening	● ● ● ● ●		Listening	● ● ● ● ○	Mòoré :	Native
	Speaking	● ● ● ● ○		Speaking	● ● ● ○ ○		

📖 Selected Publications

> **C. A. Ouedraogo**, , S. Medjiah, C. Chassot, K. Drira, and J. Aguilar, "A cost-effective approach for end-to-end qos management in nfv-enabled iot platforms," *IEEE Internet of Things Journal* **(Major revision)**, 2020.

> L. Morales, **C. A. Ouedraogo**, J. Aguilar, C. Chassot, S. Medjiah, and K. Drira, "Experimental comparison of the diagnostic capabilities of classification and clustering algorithms for the QoS management in an autonomic IoT platform," *Service Oriented Computing and Applications*, June 2019.

> **C. A. Ouedraogo**, S. Medjiah, C. Chassot, and J. Aguilar, "Flyweight Network Functions for Network Slicing in IoT," in *2018 International Conference on Smart Communications in Network Technologies (SaCoNeT)*, (El Oued, Algeria), Oct. 2018.

> **C. A. Ouedraogo**, S. Medjiah, and C. Chassot, "A Modular Framework for Dynamic QoS Management at the Middleware Level of the IoT : Application to a OneM2M Compliant IoT Platform," in *IEEE International Conference on Communications (ICC 2018)*, (Kansas City, États-Unis), IEEE, May 2018.

> Y. Banouar, **C. A. Ouedraogo**, C. Chassot, and A. Zyane, "QoS management mechanisms for Enhanced Living Environments in IoT," in *2017 IFIP/IEEE Symposium on Integrated Network and Service Management (IM)*, (Lisbon, Portugal), IEEE, May 2017.

💡 Interests

Volunteering	Android QA Tester (DIVIMAP, DIVIDOC) at International Committee of the Red Cross (2020) Chief Information Officer at "Junior INSA Services" (Since 2019). Active member in "FOR YOU" at Sciences and Technologies Faculty of Settat (2013 – 2014) Head of External Relations in "Amicale des étrangers" of EST Fez (2012 – 2013).
Misc :	Programming, Music, Technologies, Geopolitics / Realpolitik, Traveling.
Arts :	Photography.

👥 Reference

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(last update : 25/06/2020)