

# Malika BENDECHACHE

## PERSONAL DATA

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## SUMMARY

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I have recently joined the school of computing at Dublin City University as a Lecturer/Assistant professor.

My background and research interests span the areas of Big data Analytics, Machine Learning, Business Analytics, Parallel and Distributed Systems, Simulation of Cloud/Edge Computing environments, Edge/Fog and IoT Analytics.

Previously, I have held the position of Post-Doctoral Researcher at the Irish Institute of Digital Business (IIDB, dotLab), School of Business, Dublin City University (DCU). My work was part of the RECAP Horizon 2020 project that focused on developing the next generation of Cloud/Edge/Fog Computing through Optimisation, Automation and Simulation (simulation of large-scale Cloud and Edge-/Fog- Computing environments).

I have also occupied the position of Post-Doctoral Researcher at the CONSUS research centre, School of Computer Science, University College Dublin (UCD) in collaboration with Origin Enterprises PLC. I applied Machine Learning techniques on real agriculture sensor data to improve sustainable crop production and management techniques, which will lead to more efficient food production with a lower environmental impact.

I obtained my PhD in Computer Science within 3 years at Insight Centre for Data Analytics, UCD. My PhD topic is 'Study of Distributed Dynamic Clustering Framework for Spatial Data Mining': I proposed and developed a new distributed Data Mining framework to analyse Big Data and produce accurate results within reasonable response times.

## WORK EXPERIENCE

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JAN 2020 NOW	<p>Lecturer/Assistant Professor <i>School of Computing, Dublin City University, Ireland</i> Teaching the modules: Security, Blockchain, and Cryptography</p>
OCT 2018 DEC 2019	<p>Post-Doctoral Researcher <i>Irish Institute of Digital Business (IIDB), School of Business, DCU, Ireland</i> Design, development and simulation of breakthrough Cloud and Edge-/Fog- Computing technology applications.</p>
JAN 2018 NOW	<p>Part-time Lecturer at CCT <i>CCT College Dublin, Ireland</i> Design and Deliver the undergrad module: Fundamentals of Statistics for Data Analytics. Tutor 3<sup>rd</sup> year students in the School of Computing.</p>
JAN 2018 NOW	<p>Programme Developer <i>CCT College Dublin, Ireland</i> Programme development of four diplomas (i.e., MSc in Science, Diploma in Data Analytics for Business, Diploma in Artificial Intelligence, Diploma in Applied Software Development, and Diploma in Networking &amp; Systems Security). All programmes obtained the QQI Irish state accreditation.</p>
JUN 2019 AUG 2019	<p>Supervising Two MSc students during their internships <i>Irish Centre for Cloud Computing and Commerce (IC4), DCU, Ireland</i> Comparing the two implementations of a Parallel DBSCAN using Map-Reduce and Spark. Modeling and simulation of ElasticSearch using CloudSim.</p>
JAN 2018 JUL 2018	<p>Post-Doctoral Researcher <i>CONSUS Research Centre, UCD, Ireland</i> Applying machine learning techniques to improve sustainable crop production and management techniques, optimising crop production efficiency, which will lead to a more efficient food production with a lower environmental impact.</p>
FEB 2018 JUN 2018	<p>Supervising Two Erasmus MSc students during their internships <i>Insight Centre for Data Analytics, UCD, Ireland</i> Parallel Distributed Ensemble-Based Classification Using Map-Reduce. Parallel extraction of Regions-of-Interest from social media data.</p>
JUN 2017 AUG 2017	<p>Mentoring a MSc student during his internship <i>Insight Centre for Data Analytics, UCD, Ireland</i> Implementing a distributed clustering algorithm using MapReduce.</p>
JAN 2015 JUL 2017	<p>Teacher Assistant and Demonstration <i>UCD, Ireland</i> Planning and delivering well-structured lab sessions which engage and motivate students in Cloud Computing (MSc), Data Mining (MSc), Java (3<sup>rd</sup> year) and Information Theory (2<sup>nd</sup> year).</p>
JAN 2015 JUL 2017	<p>Tutor and IT Support <i>UCD, Ireland</i> Providing an academic support to Computer Science students and helping them with course materials that they struggle to understand.</p>
SEP 2012 JAN 2014	<p>Research Internship <i>Erasmus Mundus, Averroes scholarship, Waterford Institute of Technology (WIT), Ireland</i> Application of data mining techniques on distributed intelligent systems.</p>
JAN 2013 MAR 2013	<p>Research Internship <i>General and Parallel Computational Research Group (PCRG), UCD, Ireland</i> Modelling of a distributed intelligent system as a multi-objective optimisation problem for solving the problem of distributed data mining.</p>
NOV 2008 MAR 2009	<p>Work Placement <i>Corps Gras de Bejaia (CO.G.B.Belle), Algeria</i> Designing and developing an advertisement website for the company.</p>
MAR 2008 MAY 2008	<p>Internship <i>Vice-Rectorate for the Promotion of Scientific Research and External Relations, University of A-Mira of Bejaia, Algeria</i> Designing and developing a web application for management of research projects.</p>

## EDUCATION

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- JANUARY 2018    PhD in COMPUTER SCIENCE, **University College Dublin**, Ireland.  
Title: "Study of Distributed Dynamic Clustering Framework for Spatial Data Mining".
- JANUARY 2014    Researcher in DATA MINING and DISTRIBUTED SYSTEM.  
**Waterford Institute of Technology (WIT), Waterford, Ireland.**  
Scholarship of 18 months.  
Subject: Data Mining Techniques and Distributed Intelligent Systems.
- JULY 2010        MSc in NETWORKS AND DISTRIBUTED SYSTEMS (RANKING: 1<sup>st</sup>/192).  
**University A-Mira of Bejaia**, Algeria.  
Thesis: " Performance Evaluation of peer-to-peer Networks".
- JULY 2008        BSc in COMPUTER SCIENCE (RANKING: 3<sup>rd</sup>/250).  
**University A-Mira of Bejaia**, Algeria.

## ACTIVITIES AND HONOURS

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### HONOURS

- JULY 2019        **3rd Place** in Challenge-Up-2019 competition: Multi-modal Fall Detection for Healthcare.
- JULY 2015        **Best paper** at International Conference on Spatial Data Mining (ICSDM-2015).  
Paper Title: Distributed Clustering Algorithm For Spatial Data Mining.

### ACTIVITIES

- JULY 2016        Mentoring BT Young Scientist Business Bootcamp working on the commercial and social development of their projects at NovaUCD.
- JUNE 2016        Participating in the Insight hackathon for data science.
- MARCH 2016     Mentoring and encouraging teenage girls and their parents in Girl-shHackIreland event to consider careers in STEM (Science, Technology, Engineering and Maths).

## SKILLS

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### Parallel and Distributed System:

- **Multi-Agent Systems:** JAVA Agent Development Framework (JADE).
- **Apache Hadoop and MapReduce.**
- **Cloud Services:** Amazon (AWS, EC2 and S3) and Google (App Engine).
- **Simulation of Cloud, Edge/Fog and IoT:** simulation tools; CloudSim.
- **Peer-To-Peer Networks:** Gnutella, eMule, Torrent.

### Data Analysis:

- **Data Preparation:** data cleaning, data profiling, pre-processing and data warehousing.
- **Machine Learning, Data Mining and Data Analytics:** Classifications, Prediction, Regression, Association, Clustering, etc.
- **Deep Learning:** TensorFlow.
- **Data Mining tools:** Weka and RapidMiner.
- Data Modelling and Evaluation.

- Big Data Management and Processing.

#### Various Skills:

- Data structures, Graphs and algorithms complexity analysis.
- **Programming and scripting languages:** HTML, Python, R, Bash, Java, Latex and PHP.
- **IDEs:** Eclipse, NetBeans, Code::Blocks and PyCharm.
- **OSes:** Windows, Linux and Mac.
- **Data Visualisation Tools:** Tableau, Gnuplot.
- **Databases:** MYSQL, MongoDB, and Cassandra.
- **Communication Networks:** LAN and WAN.
- **Mobile Development:** Kivy on Android.
- **Web Development:** Django.

#### LANGUAGES

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BERBER:    Mothertongue  
ENGLISH:   Fluent  
FRENCH:    Fluent  
ARABIC:    Fluent

#### INTERESTS AND ACTIVITIES

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I am a big fan of Technology (VR, IoT, Drone, etc.). I also enjoy running, travelling and playing foosball.

## PUBLICATIONS

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### Journals

1. Bendeche, Malika, Sergej Svorobej, Patricia Takako Endo, James Byrne, and Theo Lynn. Simulating resource management across the c2t continuum: A survey and future directions. *An International Journal of Simulation Modelling Practice and Theory*, 2019 “Under Review”
2. Bendeche, Malika, Patricia Endo, Santos Guto, Leoni, Mark Cummins, and Theo Lynn. Crude oil price forecasting using a long short-term memory model. *Energy Economics Journal*, 59, 2019 “Under Review”
3. Bendeche, Malika and M-Tahar Kechadi. Application of data mining to precision agriculture. *An International Journal on Advances in Precision Agriculture*, 19, 2018 “Under Review”
4. Christos K Filelis-Papadopoulos, Patricia Takako Endo, Bendeche, Malika, Sergej Svorobej, Konstantinos M Giannoutakis, George A Gravvanis, Dimitrios Tzovaras, James Byrne, and Theo Lynn. Towards simulation and optimization of cache placement on large virtual content distribution networks. *Journal of Computational Science*, 39:101052, 2019
5. Sergej Svorobej, Patricia Endo, Bendeche, Malika, Giannoutakis Christosand, Konstantinos M., A. Gravvanis George, Tzovaras Dimitrios, James Byrne, and Theo Lynn. Simulating fog and edge computing scenarios: An overview and research challenges. *An International Journal of Future Internet*, 11, 2019
6. Bendeche, Malika, Tari A-Kamel, and M-Tahar Kechadi. Parallel and distributed clustering framework for big spatial data mining. *International Journal of Parallel, Emergent and Distributed Systems*, 0(0):1–19, 2018

### Conferences

1. Bendeche, Malika, Silva Ivanovitch, Santos Guto, Leoni, Guedes Luiz, Affonso, Sergej Svorobej, Mario Manuel, Noya, Ares M.Eduardo, James Byrne, Patricia Endo, and Theo Lynn. Analysing dependability and performance of a real-world elastic search application. In *9th Latin-American Symposium on Dependable computing (LADC)*. IEEE, 2019 “Accepted”
2. Bendeche, Malika, Sergej Svorobej, Patricia Endo, James Byrne, Mario Manuel, Noya, Ares M.Eduardo, and Theo Lynn. Modelling and simulation of elasticsearch using cloudsim. In *23rd International Symposium on Distributed Simulation and Real Time Applications (DS-RT-2019)*. IEEE, 2019
3. Bendeche, Malika, Nhien-An Le-Khac, and M-Tahar Kechadi. Performance evaluation of a distributed clustering approach for spatial datasets. In *15th International Conference on Australasian Data Mining Conference (AusDM)*. CRPIT, 2017
4. Bendeche, Malika, Nhien-An Le-Khac, and M-Tahar Kechadi. Hierarchical aggregation approach for distributed clustering of spatial datasets. In *16th International Conference on Data Mining Workshops (ICDMW)*, pages 1098–1103. IEEE, 2016
5. Bendeche, Malika, Nhien-An Le-Khac, and M-Tahar Kechadi. Efficient large scale clustering based on data partitioning. In *International Conference on Data Science and Advanced Analytics (DSAA)*, pages 612–621. IEEE, 2016
6. **Best Paper Award:** Bendeche, Malika and M-Tahar Kechadi. Distributed clustering algorithm for spatial data mining. In *2nd International Conference on Spatial Data Mining and Geographical Knowledge Services (ICSDM)*, pages 60–65. IEEE, 2015

### Books / Book Chapters

1. Silvano Ramos de Assis Neto, Guto Leoni Santos, Elisson da Silva Rocha, Malika Bendeche, Pierangelo Rosati, Theo Lynn, and Patricia Takako Endo. Detecting human activities based on a multimodal sensor data set using a bidirectional long short-term memory model. In *Challenges and Trends in Multimodal Fall Detection for Healthcare*, chapter 4. Studies in Systems, Decision and Control, Springer, 2019. Part of the Challenge UP 2019: Multimodal Fall Detection competition “3rd place in Challenge Up competition”
2. Malika Bendeche, Sergej Svorobej, Minas Spanopoulos, Patricia Takako Endo, and Theo Lynn. Simulating across the cloud 2 thing continuum. In *RECAP Open Access Book*, chapter 6. Springer, 2019 “Submitted”

3. Sergej Svorobej, Jorg Domaschka, Malika Bendeache, Frank Griesinger, and Theo Lynn. Orchestration from the cloud to edge. chapter 4. Springer, 2019 “Submitted”

#### Posters

1. Bendeache, Malika and Kechadi Tahar. Distributed clustering as a new approach for big data analysis. In *Insight Student Conference-17*, 2017
2. Bendeache, Malika and Kechadi Tahar. Efficient large-scale clustering based on data partitioning. In *Insight Student Conference-16*, 2016

#### PEER REVIEWED PAPER

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1. Ad-hoc edge cloud: A framework for dynamic creation of edge computing infrastructures. In *ICCCN 2019: 28th International Conference on Computer Communications and Networks*, 2019
2. Fuzzy k-prototype clustering with map reduce based privacy preserving high-order heterogeneous data. *Journal of Ambient Intelligence and Humanized Computing*, 2018