

# Saloua Bennani

Software Engineer - PhD in  
Computer Science

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## Interests

Model Based Engineering, collaborative Engineering, Software Engineering, Data Science, Machine Learning.

## Education

- 2016 – 2020 **PhD in Computer Science**, *CoDiplomation between University of Toulouse Jean Jaures and University of Mohammed V in Rabat.*  
Thesis : « An MDE approach for collaborative alignment of heterogeneous models »
- 2011 – 2014 **Engineer's degree in Computer Science**, ENSIAS, Rabat, Morocco, with honours.
- 2009 – 2011 **Preparatory Classes**, *Mathematics & Physics*, Ibn Taimiya High School, Marrakesh, Morocco.
- 2009 **Secondary school diploma in Mathematics**, *Abou Abass Essebti High School*, Marrakesh, Morocco, with honours.

## Employment

- 2017 – 2021 **Teaching Assistant**, UNIVERSITY OF TOULOUSE JEAN JAURES, *Maths-Info Department*, France.  
The university of Toulouse Jean Jaures is the founding member of the Toulouse Midi-Pyrénées Federal University.  
**Trainings** : Object-Oriented Analysis and Design - Databases - Algorithmic - Advanced Data Structures - Python - Process Modelling
- 2016 – 2020 **PhD**, INSTITUT DE RECHERCHE EN INFORMATIQUE DE TOULOUSE, France.  
The topic concerns the collaborative alignment of a system's models to create a global consistent view. During this PhD, I realized the following tasks :
- A Model Based approach for heterogeneous models alignment.
  - Collaborative Decision Making Language : Metamodel for group decision making in collaborative sessions.
  - Collaborative Decision Making Patterns : Set of configurable patterns to instantiate collaborative sessions.
  - Inter-model Semantic links definition.
  - Support tool for collaborative model alignment : Prototype allowing the use of the collaboration patterns and the instantiation of the proposed process.
  - Research papers in international conferences and peer-reviewed journals concerning model based and collaborative engineering.
- Environnement** : SPEM, Eclipse Modeling Framework, EMFCollab, Xtext, Object Constraint Language, MagicDraw, PrimeFaces, MySQL.

- 08/2014 – **Software Engineer**, CAPGEMINI, Morocco,  
 04/2016 « Third-Party Application Maintenance of SFR's CRM ».  
 Capgemini is a global leader in consulting, digital transformation, technology and engineering services counting around 270,000 team members in almost 50 countries, whereas SFR is a French mobile communications company that serves millions of households in France.
- Incidology management on SFR Entreprises CRM.
  - Technical and functional support (diagnostic and resolution of anomalies).
  - Development of business solutions with the client.
  - Management of project documentation and operating procedures writing in coordination with the client.
  - Writing of deliverables (specs, manual guides for the deployment and support of the environment).
  - Support to end users & customer relationship management.
  - Implementation and Integration of solutions.
  - Testing and Delivery of impacted modules.
  - Processing of mass requests (with PL/SQL Scripts or an ETL using Talend Open Studio).
- Environnement : Java, Jakarta EE, Webservices (weblogic, SOAP), Batches (PL/SQL, shell), CRM Clarify Amdocs, Oracle 10g, ClearBasic, HP ALM, Talend Open Studio.**
- 02/2014 – **R&D Intern**, EBC SYSTEM MAROC, Morocco,  
 07/2014 « Electronic Document Management system of LAFARGE France ».  
 EBC System is specialized in IT systems and software consulting. Lafarge is a French building materials company that mainly produces and sells cement, aggregates and ready-mixed concrete worldwide.
- Analysis, design and development of Jakarta EE solutions.
  - Functional test scenarios writing.
  - Java unit tests writing.
  - Development of data manipulation services.
  - Development of webscripts for Alfresco services invoking.
  - Invocation of Alfresco services from Lafarge suppliers portal : capitalization on end users habits.
- Environnement : Jakarta EE, ALFRESCO, Hibernate, Spring (IoC, MVC), JavaScript, jQuery, Maven, Oracle, DBUnit, Git, REST, AgileFant, Jira.**
- 07/2013 – **Business Intelligence Intern**, ANRT, Morocco,  
 08/2013 « Monitoring of Moroccan Telecom Operators competition ».  
 ANRT is a Moroccan public body aiming to regulate telecommunications in Morocco.
- Data extraction from spreadsheet source files.
  - Design and supply of Datamarts.
  - Data unification and loading in the Subscriber Park Datamart.
  - Design and production of Dashboards.
- Environnement : Talend Open Studio, Oracle 10g, OBIEE.**
- 07/2012 – **Development Intern**, OCP GROUP, Morocco,  
 08/2012 « Management of external consultants assignments ».  
 OCP group is a Moroccan based phosphate rock miner, phosphoric acid manufacturer and phosphate fertilizer producer. The group is now one of the world's largest producers of phosphate and phosphate-based products.
- Design and development of a web-based application for external consultants assignments management.
- Environnement : Jakarta EE, JSP, Hibernate, MySQL, HTML5, CSS3, PHPMyAdmin.**

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## Research Activities

- Laboratories Institut de Recherche en Informatique de Toulouse (IRIT), Toulouse, France.  
Recherche Advanced Digital Entreprise Modeling and Information Retrieval (ADMIR),  
Rabat, Morocco.
- Research topics Model-Driven Engineering, Collaboration, Model Matching, Model evolution, Collaborative  
Software Processes Engineering, Group Decision Making Patterns, Web Semantic, Machine  
Learning.
- Thesis Bernard Coulette, University of Toulouse Jean Jaures, IRIT Laboratory.
- Supervisors Mahmoud Nassar, University of Mohammed V in Rabat, ADMIR Laboratory.
- Thesis Sophie Ebersold, University of Toulouse Jean Jaures, IRIT Laboratory.
- Advisors Mahmoud El Hamlaoui, University of Mohammed V in Rabat, ADMIR Laboratory.
- Realizations **Group Decision Making (GDM) modelling language** : MMCollab, a metamodel defining the core concepts for GDM.  
**GDM Patterns** : Extensible set of collaboration patterns customizable according to the context of collaboration.  
**Collaborative Alignment Process** : a process using MMCollab and the proposed GDM patterns to match the heterogeneous models representing a complex system.  
**Support tool for collaborative model alignment.**
- External Journal of Computer and Information Systems (since 10/2020).
- Reviewer Evaluation of Novel Approaches to Software Engineering (ENASE 2019).  
Middle East and North Africa Conference of Information System (MENACIS 2020).
- Organisation Member of the organisation comitee for STAF conference : Software Technologies : Applications and Foundations (STAF 2018) from 25 to 29 june 2018 in Toulouse.

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## Publications

### Journal Papers

- CIS 2020 Saloua Bennani, Ilias Ait El Kouch, Mahmoud El Hamlaoui, Sophie Ebersold, Bernard Coulette and Mahmoud Nassar. **A Formalization of Group Decision Making in Multi-Viewpoints Design**. Computer and Information Science (CIS), DOI :10.5539/cis.v13n1p58. DBLP, 2020.
- JOT 2020 Mahmoud El Hamlaoui, Sophie Ebersold, Saloua Bennani, Adil Anwar, Taoufiq Dkaki, Mahmoud Nassar and Bernard Coulette. **A model-driven approach to align heterogeneous models of a complex system**. Journal of Object Technology (JOT), under review.
- JSEP 2020 Saloua Bennani, Mahmoud El Hamlaoui, Sophie Ebersold, Bernard Coulette and Mahmoud Nassar. **CAHM : a process-oriented collaborative approach to ensure heterogeneous source models global consistency**. Journal of Software : Evolution and Process (JSEP), under review.

### International Conferences

- WETICE 2019 Saloua Bennani, Sophie Ebersold, Mahmoud El Hamlaoui, Bernard Coulette and Mahmoud Nassar. **A Collaborative Decision Approach for Alignment of Heterogeneous Models**. The 28<sup>th</sup> IEEE International Conference on Enabling Technologies : Infrastructure for Collaborative Enterprises (WETICE'2019), 12-14 June, Capri, Italy, IEEEExplore digital library. (Core B ranking).

- CCIS book 2019 Mahmoud El Hamlaoui, Saloua Bennani, Sophie Ebersold, Mahmoud Nassar and Bernard Coulette. **AHM : Handling Heterogeneous Models Matching and Consistency via MDE**. Communications in Computer and Information Science (CCIS), SPRINGER, 2019. DOI : 10.1007/978-3-030-22559-9\_13. (summary book).
- CSCWD 2018 Saloua Bennani, Mahmoud El Hamlaoui, Mahmoud Nassar, Sophie Ebersold and Bernard Coulette. **Collaborative model-based matching of heterogeneous models**. The 22<sup>nd</sup> International Conference on Computer Supported Cooperative Work in Design (CSCWD'2018), 9-11 May, Nanjing, China, IEEEExplore digital library. (Core B ranking).
- SAC 2018 Mahmoud El Hamlaoui, Saloua Bennani, Sophie Ebersold, Mahmoud Nassar and Bernard Coulette. **Heterogeneous design models alignment : from matching to consistency management**. The 33<sup>rd</sup> ACM/SIGAPP Symposium On Applied Computing (SAC'2018), 9-13 April, Pau, France, ACM digital library. (Core B ranking).
- ENASE 2018 Mahmoud El Hamlaoui, Saloua Bennani, Mahmoud Nassar, Sophie Ebersold and Bernard Coulette. **A MDE approach for heterogeneous models consistency**. 13<sup>th</sup> International Conference on Evaluation of Novel Approaches to Software Engineering (ENASE'2018), 23-24 March, Madeira, portugal, SciTePress. (Core B ranking).
- GEMOC 2016 Mahmoud El Hamlaoui, Bernard Coulette, Sophie Ebersold, Saloua Bennani, Mahmoud Nassar, Adil Anwar, Antoine Beugnard, Jean-Christophe Bach, Yassine Jamoussi and Hanh Nhi Tran. **Alignment of viewpoint heterogeneous design models : "Emergency Department" Case Study**. 4<sup>th</sup> International Workshop On the Globalization of Modeling Languages (GEMOC@MODELS'2016), 2-7 october, Saint-Malo, France, CEUR Workshop Proceedings.

#### Posters

- ESOF 2018 ***Towards a collaborative matching approach to relate sustainable cities design models***. Poster In EuroScience Open Forum. ESOF 2018. Toulouse, France.

#### Talks

- GDR GPL 2018 ***Collaborative alignment of heterogeneous design models***. Workshop of Model Driven Engineering group of GDR GPL. 5 April 2018, LIP6. <http://idm2018.lip6.fr/slides/Saloua.pdf>.
- Seminars ***Alignement de modèles hétérogènes***. Research seminar to master's degree students in French, University of Toulouse Jean Jaures. 28 Avril 2017.  
***Towards a collaborative alignment approach to relate Heterogeneous design models***, Seminar Team SM@RT, Villebrumier Castle, Toulouse, 2018.

#### Teaching

- 2017 – 2021 **Advanced data structures in Python/ C2I / PIX**.  
 UNIVERSITY OF TOULOUSE JEAN JAURES, France (2<sup>nd</sup> year post-secondary)
- 2019 – 2021 **Tutoring Project / Object-Oriented Programming in Python**.  
 UNIVERSITY OF TOULOUSE JEAN JAURES, France (Bachelor)
- 2019 – 2021 **Algorithmic programming in Python**.  
 UNIVERSITY OF TOULOUSE JEAN JAURES, France (2<sup>nd</sup> year post-secondary)
- 2020 – 2021 **Process Modelling with UML**.  
 UNIVERSITY OF TOULOUSE JEAN JAURES, France (graduate level : master)
- 2020 – 2021 **Relational databases**.  
 UNIVERSITY OF TOULOUSE JEAN JAURES, France (1<sup>st</sup> year post-secondary)

2018 – 2019 **Object Oriented Design.**  
IUT BLAGNAC, France (1<sup>st</sup> year post-secondary)

## Key Skills

Languages	JAVA, ANDROID, SQL/PLSQL, PYTHON, Shell.
Web & Technologies	HTML, PHP, CSS, XML, JAVASCRIPT, MAGENTO, TOMCAT, HIBERNATE, JSF, Spring Framework, JAKARTA EE, WebServices (SOAP, REST).
Research	BPMN/SPEM, Xtext, Model-Driven Engineering, EMF, JBPM, OCL, Model-Based Software Engineering, EMF, SPLE, MVC.
SGBD	MYSQL, ORACLE 10G, SQL SERVER, OBJECTSTORE, SQLITE.
Tools	MATLAB, MAGICDRAW, PALLADIO, FEATUREIDE, TALEND, OBIEE, SSIS, SSAS, SSRS, PENTAHO, JIRA CONFLUENCE, MICROSOFT POWER BI, GIT.
Business	Telecom, Orchestration and management of inter-model links, Writing of functional and technical specifications (English & French), Customer relationship management.
Soft Skills	Analysis and synthesis, Rigor, Diplomacy, Versatility, Autonomy, Organization, Adaptability.

## Tongues

French	Bilingual
English	Bilingual (TOEIC 910/990)
Arabic	Native
Spanish	Beginner

## Accomplishments & Memberships

2020	Professional Scrum Product Owner (97,5%)
2018-2020	Member IEEE.

## References

### **Bernard Coulette**

Professor  
Maths-Info Department  
University of Toulouse Jean Jaures  
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31058, Toulouse, France  
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### **Sophie Ebersold**

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### **Mahmoud El Hamlaoui**

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University of Mohammed V in Rabat, ENSIAS  
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BP 713, Rabat, Morocco  
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