

Curriculum Vitae

Dr. Borhen Louhichi

PERSONAL DATA

DATE OF BIRTH: September 19th, 1978
NATIONALITY: Canadian - Tunisian
ADDRESS: Higher Institute of Applied Sciences and Technology of Sousse,
City Taffala, Ibn Khaldoun - Sousse 4003, Tunisia.
EMAIL: borhen.louhichi@etsmtl.ca
PHONE: +21653889887

EXPERTISE

Computer Aided Design; Computer Aided Manufacturing; Additive Manufacturing/ 3D Printing; Geometric Modeling; Product Lifecycle Management; Project Management; Innovation.

PROFESSIONAL EXPERIENCE

05/2016 -PRESENT	Associate Professor (HDR) at the Higher Institute of Applied Sciences and Technology of Sousse, Tunisia. Adjunct Professor at École de Technologie Supérieure de Montréal, Canada.
2014-2016	Teacher, Trainer and Assistant Professor at the Higher Institute of Applied Sciences and Technology of Sousse, Tunisia.
2011-2013	Engineer and Post-Doctoral Research Associate at Ecole de Technologie Supérieure de Montréal (ETS), Canada. Teacher and Trainer Online (E-learning) at the International Institute for Water and Environmental Engineering, Ouagadougou, Burkina Faso.
2010-2011	Post-Doctoral Research Associate at the University of Liège, Belgium.
2002-2010	Trainer and Teaching Assistant at the National Engineering School of Monastir, Tunisia.

EDUCATION

2008-2015	Accreditation To Supervise Research (HDR) in Mechanical Engineering, <i>University of Technology of Compiègne, France</i> Thesis: <i>"Integration of tools of Design, Simulation and validation of mechanical products"</i> ; defended on May 22nd, 2015.
2004-2008	PhD student in Mechanical Engineering, <i>National Engineering School of Monastir, Tunisia and The University of Quebec at Trois-Rivieres, Canada.</i> Thesis: <i>"Reconstruction of the CAD model from Finite Element results"</i> ; defended on January 19th, 2008.

- 2002-2003 | Master Science in Mechanical Engineering, *National Engineering School of Monastir, Tunisia and The University of Quebec at Trois-Rivieres, Canada.*
Thesis: "Reconstruction of the RREP model from deformed mesh in the elastic deformation case"; defended on July 2003.
- 1997-2002 | Engineering degree, *National Engineering School of Monastir, Tunisia.*
Thesis: "Development of a Data Base of CAD models using OpenCascade Plate-forme"; defended on July 2002.

CERTIFICATES

- OCT. 2019 | Certificate in **Autodesk Digital Manufacturing with Autodesk Fusion 360, Autodesk.**
- SEPT. 2019 | Certificate in **The Future of Work: Preparing for Disruption, World Bank.**
- SEPT. 2019 | Certificate in **International Organizations Management, University of Geneva, Suisse.**
- JULY 2019 | Certificate in **Innovation, Markets, and Entrepreneurship, University of Coruna, Spain.**
- JUNE 2019 | Certificate in **Technology Transfer and Commercialization, Seoul, Korea.**
- FEBR. 2018 | Certificate in **Energy Efficiency in Buildings, University of Genova, Italy.**
- APRIL. 2014 | Certificate in **SolidWorks Associate - Mechanical Design, SolidWorks.**

COMPUTER SKILLS

- Windows, Linux.**
- Programming tools:** C, C++, Visual Basic, Maple, MatLab, Html, Php...
- Common Application Architecture:** API Solidworks, API Catia with C++/VBA, OpenCascade.
- CAD/CAM:** CATIA V5, Solid Edge, Nx, Autodesk (Certified), SolidWorks (Certified SolidWorks)...
- FEA:** ANSYS, COSMOS, Solidworks Simulation, CATIA Analysis.

SERVICES AND PROFESSIONAL MEMBERSHIPS

- 09/2019 - PRESENT | President of the **Tunisian Organization of 3D Printing (To3DP), Tunisia.**
- 03/2019 - PRESENT | Responsible of the **Technology Transfer Office, University of Sousse, Tunisia.**
- 01/2019 - PRESENT | Expert Design and Multimedia at **Union Tunisienne de l'Industrie, du Commerce et de l'Artisanat - UTICA, Tunisia.**
- 01/2018 - PRESENT | Member of the scientific committee **of the University of Sousse, Tunisia.**
- 02/2017 - 12/2017 | **Horizon 2020-National Contact Point for Industrial Leadership: Nanotechnologies, advanced materials, advanced manufacturing and processing, Ministry of Higher Education and Scientific Research, Tunisia/ European Commission.**
- | Reviewer for Concurrent Engineering: Research and Applications, Advances in Mechanical Engineering.

Member of the Scientific Committee:

PLM15 (<http://www.plm-conference.org/plm15>), Doha, Qatar, October 2015.

PLM14 (<http://www.procomu.jp/plm14>), Yokohama Symposia, Japan, July 2014.

PLM13 (<http://www.plm-conference.org/plm13.php>), Nantes, France, July 2013.

PLM12 (<http://www.plm-conference.org/plm12.php>), Montréal, Canada, July 2012.

Member of the Organization Committee and editor of the proceeding of the PLM12 conference.

Organizer of the 24 hours of Innovation in Tunisia.

Many activities with the Agence Universitaire de la Francophonie (AUF): Training, on-line degree courses...

Member of the Organization Committee and editor of the proceeding of the PLM12 conference (Member of the IFIP Working Group WG 5.1).

Member of the Association of Scientific Research and Innovation in Computer Science ARSII, since 2016.

Member of the North American Tunisian Engineers Group (NATEG), since 2013.

Member of the Tunisian Association of Mechanical Engineering, since 2010.

PRINCIPAL ENGINEERING, RESEARCH AND DEVELOPMENT PROJECTS

Member of the SATELIT project (2016 - 2019)

The main goal of the SATELIT project <http://www.satelit-project.com/> is to reinforce the Universities of Maghreb within its innovation ecosystem due to the capacities, cross-sectoral partnership and leadership in order to:

- o Adapt its positioning according to the evolution.
- o Create the collaboration between public and private partners for the networking and the harmonisation of the university systems.
- o Support the cooperation between both shores in order to achieve the Euro-Mediterranean area of Higher Education, Research and Innovation.
- o Contribute to the long-term improvement of the area's performance level in the Innovation and Technology Transfer field.
- o Increase the project's action ability through the geographical and institutional enlargement of the partnership.

Member and Co-Supervisor of many Engineering and Research Projects (2014 - 2017)

CAD/Tolerancing integration: Mechanical assembly with form defects;

Additive Manufacturing: Developing a Geometrical Complexity Metric (GCM) for improving the AM process. In fact, a valid and accurate quantitative metric to identify high-complexity products early on in the manufacturing process is most valuable to a company in a design-for-manufacturing context. The GCM enable the determination of the optimal orientation of the part in the printer and could help engineering teams identify high-complexity products as early as the design phase;

Inspection of Deformable Bodies: We aim to develop a non-rigid inspection technique to eliminate the need for specialized inspection fixtures by using a non contact measuring system such as optical scanning and comparing the obtained point cloud from the distorted part with the nominal model to identify deviations;

Associations Management and Change Propagation in the CAD Assembly.

Engineer coordinator and Postdoctoral Researcher (2011 - 2013) CRIAQ Projects: The Consortium for Research and Innovation in Aerospace in Québec, Canada - CRIAQ-MANU501 and CRIAQ-PLM2 projects.

CRIAQ-MANU501 (January 2013 - December 2013) CRIAQ-MANU501 is a joint project between ETS, UQTR, University of Sherbrooke, Bombardier Aerospace, Creaform 3D, NSERC, and CTA).

Task Development of a non-rigid inspection technique to eliminate the need for specialized inspection fixtures by using a non-contact measuring system such as optical scanning and comparing the obtained point cloud from the distorted part with the nominal model to identify deviations.

CRIAQ-PLM2 (February 2011 - December 2012) CRIAQ-PLM2 (Collaborative development for Product Lifecycle Management) is an innovative partnership between five universities (McGill University, Concordia University, University of Sherbrooke, Ecole Polytechnique de Montreal, and ETS) and five major aerospace companies (Bombardier Aerospace, Pratt-Whitney, CAE, Rolls-Royce, and CMC Electronics) based in the province of Quebec, Canada.

Participants are exploring current and future collaborative environments to enhance the effect of information systems functionality on PLM performance and make new product development better, faster and cheaper.

Task Development of a protocol for data sharing, that will act as a 'docking station' for Computer Aided Design (CAD) models to support the removal of CAD files (work-packages) from and their reintroduction into information systems (DMU).

Postdoctoral Researcher (April 2010 - January 2011) European Erasmus Mundus Project at the Department of Aerospace and Mechanical Engineering, University of Liege, Belgium.

Update of a geometric model after an analysis based on XFEM-levelset method. An original method for updating a CAD model (BREP = Boundary Representation) from Analysis results obtained by the Extended Finite Element Method (XFEM). This approach is based on two steps. The first step consists in a flexible representation of the original model using level-sets. In the second step, after analysis, information is extracted from the mesh and used to rebuild the CAD model. This geometric model is then used in CAD assembly simulation, a finer FE analysis, CAM (Computer Aided Manufacturing) ... The objective is to enhance the integration of the different steps of the mechanical design process (Design, Analysis, CAM...).

Co-supervisor of a graduate student in engineering and research projects (2007 - 2010)

CAD/Tolerancing integration: This research proposes a new approach to integrate the tolerances in CAD model by the determination of the configurations with defects of a CAD part, used in a mechanical system. The realistic parts are computed according to the dimensional and geometrical tolerances.

Assembly and Disassembly of the Mechanical Product.

Simplification of the CAD Model for the FE .

PhD. research project (2004 - 2008) Reconstruction of the CAD Model from a deformed mesh.

BOOK EDITION AND SELECTED PUBLICATIONS

L. Rivest, A. Bouras, B. Louhichi, **Product Lifecycle Management. Towards Knowledge-Rich Enterprises**, Edited by: Springer. 388: 2012 ISBN: 978-3-642-35757-2 (Print), 978-3-642-35758-9 (Online), 2012.

- A. Ben Makhlof, B. Louhichi, MA. Mahjoub, D. Deneux, **Reconstruction of a CAD model from the deformed mesh using B-spline surfaces**, International Journal of Computer Integrated Manufacturing, 1-13, 2019.
- S. Ben Amor, A. Tahan, B. Louhichi, **Proposition of a Geometric Complexity Model for Additive Manufacturing Process Based on CAD**, 2019 23rd International Conference Information Visualisation (IV), 442-448, 2019.
- SB. Amor, S. Abdellaoui, A. Tahan, B. Louhichi, JMRS. Tavares, **Choosing the Best Direction of Printing for Additive Manufacturing Process in Medical Applications Using a New Geometric Complexity Model Based on Part CAD Data**, ECCOMAS Thematic Conference on Computational Vision and Medical Image Processing, VipIMAGE 2019, pp 679-692, 2019.
- A. Eltaief, B. Louhichi, S. Remy, **Associations management and change propagation in the CAD assembly**, Computers in Industry 98, 134-144, 2018.
- B. Louhichi, G. N. Abenhaim, A. Tahan, **CAD/CAE integration: updating the CAD model after a FEM analysis**, The International Journal of Advanced Manufacturing Technology, Vol. 76, Issue 1-4, pp. 391-400, 2015.
- B. Louhichi, M. Tlija, A. BenAmara, A. S. Tahan, **An algorithm for CAD Tolerancing Integration: Generation of assembly configurations according to dimensional and geometrical tolerances**, Computer-Aided Design, Vol. 62, pp. 259-274, 2015.
- B. Louhichi, L. Rivest, **Maintaining consistency between CAD elements in collaborative design using association management and propagation**, Computers in Industry, Vol. 65, No. 1, pp. 124 - 135, 2014.

SUPERVISION AND CO-SUPERVISION OF THE ENGINEERING, RESEARCH AND DEVELOPMENT PROJECTS 2014-2019 PHD. AND MASTER

- Sabrina ben Amor*, "Complexity and Capability for the 3D Printing Process" (in progress), **Cooperation with FEUP, Porto, Portugal and ETS, Montreal, Canada.**
- Ahmed el Ayeb*, "Tolerancing Assistance Tool for the Additive Manufacturing Process" (in progress),
- Ameni Eltaief*, "Associations Management and Change Propagation in the Digital Muck-Up", (in progress), **Cooperation with UTT, Troyes, France.**
- Montasser Billah Letaief*, "Characterisation of differences between CAD models using CAD features" (in progress).
- Aicha Ben Makhlof*, "Reconstruction of 3D geometric model from cloud of points" (in progress), **Cooperation with UPHE, Valenciennes, France.**
- Ahmed Fradi*, "3D Object Retrieval Based on Similarity Calculation in 3D Computer Aided Design Systems" (in progress).
- Ibtissem Jbira*, "Optimisation of Geometric Specification (form defects) of mechanical parts using probabilistic methods" (in progress), **Cooperation with ETS, Montreal, Canada.**
- Marwa HajBrahim*, "A Novel approach for the inspection of deformable bodies by adapting the coherent point drift and using a clustering methodology" (in progress), **Cooperation with ETS, Montreal, Canada.**
- Anis Korbi*, "Contribution à l'optimisation des assemblages en CAO", ENIM, Tunisia, July 2019.

Aymen Maatki, "Metric of geometric complexity for the Additive Manufacturing", Avril 2017.
Ameni Eltaief, "Reconciliation of CAD associations in the Digital Muck-Up", May 2016.
Mehdi Tlija, "Contribution à la prise en compte des tolérances dimensionnelles et géométriques dans les modeleurs CAO", ENIM, Tunisia, Avril 2014.

TEACHING, TUTORING

2014-2019	<p>Higher Institute of Applied Sciences and Technology of Sousse, Tunisia. <u>Project Management</u>: (Gantt diagram, Pert diagram, stock management, interest ratio...), M1 (first year) Professional and Research Master in Mechanical Engineering, M1 (first Year) Professional Master in Energy, course and exercises. <u>Mechanical Engineering Technology</u>: Ing.3 (third year) in Engineering, course and exercises. <u>CAD/CAM</u>: L3 (third year) in Mechanical Engineering Licence, course, exercises and practical work (CATIA and Solidworks). <u>Introduction to Additive Manufacturing</u>: L3 (third year) in Mechanical Engineering Licence, course, exercises and Practical work. <u>Advanced Manufacturing</u>: M1 (first year) Professional Master in Mechanical Engineering, course, exercises and Practical work.</p>
2018-2019	<p>National Engineering School of Sousse, Tunisia. <u>Additive Manufacturing</u>: Phd. students, seminars.</p>
2016-2018	<p>EPI and Polytec School, Sousse, Tunisia. <u>Finite Element Method and Numerical Simulation</u> : Ing.3 (third year) in Engineering, course and exercises. <u>Solidworks and Catia (CAD/CAM)</u>: Ing.2 (second year) in Engineering, practical work.</p>
2011-2012	<p>Ecole de Technologie Supérieure, Montreal, Canada. <u>Advanced Manufacturing</u>: Engineering students, course and exercises.</p>
2007-2010	<p>Higher Institute of Applied Sciences and Technology of Sousse. <u>Project Management</u>: (Gantt diagram, Pert diagram, stock management, interest ratio...), Ing.3 (third year) in Engineering, course and exercises. <u>Mechanical Engineering Technology</u>: Ing.3 (third year) in Engineering, course and exercises. <u>CAD/CAM</u>: L3 (third year) in Mechanical Engineering Licence, course, exercises and practical work.</p>

VISITS (2017-2019)

SEPTEMBER 2019	<p>University of Fes, Maroc. SATELIT project.</p>
AUGUST 2019	<p>University of Coruna, Spain. Summer School, Innovation, Markets, and Entrepreneurship.</p>
JULY 2019	<p>University of Technology of Troyes, France. Co-supervision of PhD. Student.</p>

JUIN 2019	Science and Technology Policy Institute - STEPI , Seoul, Korea . Technology Training of Trainers on Technology Transfer and Commercialization.
2018	University of Genoa, Italy (2 months). PROEMED Project : Development of a new Master study Programmes on "Energy efficiency in buildings".
SEPTEMBER 2017	European Commission, Brussels, Belgium .
OCTOBER 2017	Horizon 2020, National Contact Point for Industrial Leadership: Nanotechnologies, advanced materials and advanced manufacturing and processing, Brussels, October 2017 (Meeting one week).

LANGUES

Arabic (native), **French** (advanced), **English** (advanced).

HOBBIES

Sport, **Chess**, **Travel**.