

M'Hammed Sahnoun

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Objective:

To pursue a research career in the field of automation, robotics and manufacturing science.

Education :

| Degrees | Session et University | Marks | Major Subjects |
|---|--|-----------------------------|---|
| | | Obtained/ Total | |
| PhD <i>Specialty</i> « Automation and Robotics » | 2003-2007 Université de Metz « www.univ-metz.fr » | | Title : << Design and simulation of force feedback control of a smart electrical wheelchair >> |
| Master <i>in</i> « Automation and Industrial Engineering » | 2002-2003 Université de Metz « www.univ-metz.fr » | 15 / 20 | Major Subjects: <i>Automation, computer sciences, supply chain, scheduling, maintenance, operation research, production management, industrial robotics, simulation etc.</i> Thesis: Automation and optimization of an assembly line of gas regulators. |
| Master <i>in</i> « Robotics and Intelligent Systems » | 2001-2002 Université Pierre et Marie Curie « www.upmc.fr » | 13 / 20 | Major Subjects: <i>Artificial intelligence, machines learning, automation, control, micro-robotics, mobile robotics, mechanics, mechatronic, vision (image processing) etc.</i> Project: Simulation and modeling of an active exoskeleton, used for robot walking, based on the artificial intelligence methods. |
| Bachelors Degree <i>in</i> « Automation Engineering » | 1996-2001 Ecole Nationale Polytechnique D'Alger « www.enp.edu.dz » | 17 / 20 | Major Subjects: <i>Automation, mechatronic, modelling, identification, signal processing, electrical engineering, computer sciences, simulation, mathematics, physics, chemistry, mechanics etc.</i> Project: Design of controller for AC to AC electrical converter based on fuzzy-logic and neuro-fuzzy-logic |

Technical Skills and Competences:

- Production System

- Modeling and simulation of dynamic systems (production systems, electrical network ...)
- Optimization of production and inspection plans in complex manufacturing systems like semiconductor manufacturing
- Risk assessment and management
- Maintenance, production and/or inspection scheduling, sampling, logistics
- Quality tools: 5S, VSM (Value Stream Mapping), SMED (Single Minute of Exchange Die), TPM (Total Productive Maintenance), Poka-Yoke, Kanban, Method Time Measurement (MTM), AMDEC

- Automation

- Design and implementation of controllers by several methods (PID, sliding mode, fuzzy-logic, Backstepping ...)
- Industrial data processing and programming of several PLC (Programmable Logic Controllers) TELEMECANIQUE, PIC and SIEMENS
- Industrial robotics, Mobil Robotics, Active exoskeleton, Smart electrical wheelchair
- Man-machine interface, man-machine interaction, haptic interfaces (Force feedback) ...
- Metaheuristics and artificial intelligence methods: neuronal network, Bayesian network, Q-learning, fuzzy logic, genetic algorithm, multi-agent systems ...

- Information and Communication Technologies

- Operating system (windows, linux "debiane")
- Microsoft Office (Excel, Word, Power Point), MS Project, LibreOffice
- Design and simulation software : Matlab/Simulink, Scilab, Adams, R, AutoCad, SolidWorks
- Programming language: VB/VBA, JAVA, C/C++, Fortran, HTML, LM "Robotics programming language")

National/International Association Memberships:

- I am an active member of the Association of Graduates from Polytechnic National School of Algeria (ADEP), since 2001.
- I am an active member of the Cultural Dauphinoise Association (CDA), Grenoble France, since 2010.

Foreign Language Skills (reading, writing and speaking):

- **Arabic:** It is my mother language and I have expert level in reading, writing and speaking Arabic.
- **French:** I have completed my Bachelor's, Master(s) and PhD degree in French from francophone universities; hence, I have excellent level of reading, writing and speaking in the French language.
- **English:** I have studied English as a subjects since my secondary school (12 years); hence, I have very good level in reading and understanding whereas I have good level in speaking and writing.

Professional Experience :

2013 :

Research engineer in control

Fortil , 830, Bv de Léry - 83500 La Seyne sur Mer, France

Scope : Within the framework of the project "The helicopter of the future" managed by the company EUROPTER, I have worked on the conception of an active suspension of the pilot seat.

Responsibilities:

- Conception of the dynamic model of helicopter + seat+ human
- Development of the simulator of the system using Scilab
- Conception and implementation of automatic control of the position of the seat by a PID regulator
- Optimization of the system parameters as the power of motors and coefficients of springs and dampers.

2012 :

post doctoral position

Polytechnic of Montréal- Canada - Mathematical and industrial engineering

Scop : As part of a collaboration with researchers from the Polytechnic school of Montreal. We completed work on the optimization of product inspection in the semiconductor manufacturing.

Responsibilities:

- Completion of some work on the optimization of inspection plans ;
- Writing scientific papers ;
- Meetings with researchers and companies interested in the same issues.

2009 – 2012: **R&D Engineer**

Laboratory: Grenoble Laboratory for Sciences of Design, Production and Optimization. (G-SCOP <http://www.g-scop.fr>)

Scope: Within the framework of European project **IMPROVE**, which aimed at optimization of production equipment utilization, I lead the team focused on process control plan optimization. We worked in close collaboration with STMicroelectronics, Crolles France where the developed algorithms were tested, deployed and industrialized. Besides R&D tasks, I also taught Courses in data processing and industrialization in industrial engineering school at the Polytechnic Institute of Grenoble (<http://genie-industriel.grenoble-inp.fr>).

Responsibilities:

- Requirement analyses and monitoring the implementation of proposed solutions
- To participate in weekly conference calls with all members of work Package
- To develop algorithms and simulators for production systems to compute optimized control plans based on risk which reduces risk by 30% besides reducing number of inspections.
- To prepare project deliverables
- To write and present articles in conferences and journals
- To teach data analysis and industrialization courses

2009 – 2012: Assistant Professor (ATER)

Université Paul Verlaine – Metz (<http://www.univ-metz.fr/>)

Scope: Teaching students of Bachelor degree in mechanical and electronics engineering: physics and measurements, data acquisition, industrial equipment qualification, Research on conduct of electric wheelchair with new haptic interfaces.

Responsibilities:

- Teaching under graduate engineering students: automation (modeling, identification, control), computer science (algorithms, programming in VB and C/C++) and PLC programming
- Supervision of undergraduate and master level projects and research theses
- Development of a control an electric wheelchair using an omni-Phnatome

2003 – 2007 PhD

Université Paul Verlaine de Metz (UPVM), au sein du laboratoire LASC (<http://www.univ-metz.fr/>)

Scope: In order to improve drivability of a smart wheelchair, we proposed an assisted control based on force feedback device to facilitate the disabled persons and improve the acceptability of the wheelchair. We also proved by simulations that the use of such control provides a real improvement in the ride quality.

Responsibilities:

- Bibliographic research in the following areas: mobile robotics, driving simulators, obstacle avoidance method, position sensors, man-machine control method, supervision and teleoperation, man-machine interfaces/interaction, force feedback interfaces, workload assessment NASA-TLX, methods of statistical validation (ANOVA, MANOVA,);
- Development of a driving simulator in Matlab/Simulink using a force feedback joystick, taking into account the indications from the disabled people riding on the wheelchair and the people around them such as family and/or medical staff.
- Experiment with non-disabled and disabled people
- Writing scientific papers in international journals and conferences
- Worked as Temporary lecturer (2004) at University of Metz and taught C/C++ to Master students.
- Worked as an assistant professor (2005-2006) where I taught automation (control, modeling, identification) and computer science (algorithmic and programming in VB, C/C++) subjects to under graduate engineering and master students.

2003**R&D Engineer**

MESURA (Forbach)- AOI Master's internship

Scope/Subject: Automation and optimization of an assembly line of gas regulators (design and industrialization)

Responsibilities:

- Analyses of existing assembly line (process and equipment)
- Identification of operations to be automated for performance improvement
- Cost benefit analysis on proposed solutions against performance criteria
- Proposition of new inspection system

- Selection and industrialization of the accepted solution (3D model using AutoCad, SolidWorkds, PLC programming)

2002

Master's Research Internship

Robotic Vision Laboratory (ENSI of Bourges <http://www.ensi-bourges.fr>)

Scope/Subject: Simulation and modeling of an active exoskeleton, used for robot walking, based on the artificial intelligence methods

Responsibilities:

- Bibliographic research on humanoid robots, artificial intelligence methods (neural network, fuzzy logic, Q-learning)
- Modeling of the exoskeleton on ADAMS and Matlab/Simulink
- Development of an intelligent controller based on Q-learning, neural network and fuzzy logic

2001

Engineering Degree Project/Internship

Process control laboratory at the polytechnic national school of Algiers - Algeria

Scope/Subject: Design of controller for AC to AC electrical converter based on fuzzy-logic and neuro-fuzzy-logic

Responsibilities:

- Modeling of an electrical network with a minimal AC/AC converter
- Design of fuzzy-logic and neuro-fuzzy-logic controller for the stabilization of intensity and frequency of electrical current
- Simulation of the system by Matlab/Simulink

Teaching Experience:

| Year | Title | Institution | Level | No. of hours |
|--------------|----------------------------|------------------------|------------------------|--------------|
| 2010-2012 | Industrialization | Grenoble INP | 2 nd GI/ply | 16 |
| | Industrial data processing | | 1 st GI | 34 |
| 2007-2008 | Visual Basic | University of Lorraine | L3/1 st IUT | 120 |
| | Control and automation | | L3 | 36 |
| | Industrial data processing | | IUT | 28 |
| | Computer sciences | | L3 | 36 |
| | Internship supervision | | Master | 24 |
| 2005-2006 | Computer sciences (C/C++) | University of Lorraine | L3/Master | 24 |
| | Control and automation | | L3/Master | 96 |
| | Internship supervision | | Master | 13 |
| 2003-2004 | Computer sciences | University of Lorraine | Master | 8 |
| | Automation | | Master | 16 |
| Total | | | | 451 |

Additional Information:

Perosnal Information: Married, 3 children, French driving license

Nationality: French / Algerians

Mobility: International

Sports: Hiking, Cinema, Chess

Publications:

Peer Reviewed International Journal(s)

- M. Sahnoun, S. Bassetto, S. Bastoini, and Ph. Vialletelle, (2010) '*Optimisation of the process control in a semiconductor company: model and case study of defectivity sampling*', International Journal of Production Research, First published on: 06 July 2010 (iFirst) ; DOI: 10.1080/00207543.2010.484429.
- M. Sahnoun, G. Bourhis, "Haptic feedback to assist powered wheelchair piloting". AMSE Periodicals, vol.67, pp. 53-63, 2006.
- M.Sahnoun, B.Bettayeb, S. Bassetto, M. Tollenaere “ *Optimization of sampling plan in semiconductor manufacturing using a multi-objectives genetic algorithms based simulation*” (submitted to Computer and Industrial Engineering).
- B.Bettayeb, S. Bassetto, M.Sahnoun, M. Tollenaere “*A quality tool to prevent excessive scrap production*” (submitted to journal of manufacturing systems).
- M.Sahnoun, B.Bettayeb, S. Bassetto, M. Tollenaere “ *optimization of sampling plan and metrology time delay*” (to be submitted to IEEE Transation on semiconductor manufaturing).
- M. Sahnoun, G. Bourhis, « *Conception et simulation d'une commande à retour d'effort pour fauteuil roulant électrique* », Sciences et Technologies pour le Handicap, Ed. Hermes, vol.1, n°2, 2007, pp. 123-141, DOI:10.3166/sth.1.123-141 (Imp Fac: 0.803)
- A. Pruski, Y. Morere, O. Horn, G. Bourhis, R. Grasse, M. Sahnoun, « Approche centrée utilisateur pour la conception d'un fauteuil roulant intelligent, Sciences et Technologies pour le Handicap », Edition Hermés, Volume 1, 1/2007, pp. 9-32, DOI:10.3166/sth.1.9-32 (Imp Fac: 0.803)

Peer Reviewed International Conference(s)

- M.Sahnoun, B.Bettayeb, M.Tollenaere, S.Bassetto, “*Smart Sampling for Risk reduction and Delay Optimisation*” IEEE International Systems Conference, SYSCON 2012, Vancouver, Canada, March 19-22, 2012.
- M-F. Bouaziz, M. Sahnoun, E. Zamaï, S. Hubac, “*Decision making based on the EHF integration in a complex semiconductor manufacturing*” , 12th European Advanced Process Control and Manufacturing Conference, APCM2012 MINATEC Grenoble, France - April 16-18, 2012
- M. Sahnoun, B. Bettayeb, P. Vialletelle, A. MILI, M. Tollenaere “*Impact of Sampling on W@R and Metrology Time delay*” Intel European Research & Innovation Conference 2011, ERIC 2011. Dublin, Ireland, 12-14 October 2011.
- M. Sahnoun, P. Vialletelle, S. Bassetto, S. Bastoini, M. Tollenaere, “*Computation of Wafer-At-Risk from Theory to Real Life Demonstration*” 13th ARCSIS Meeting, Rousset, France, November, 18-19, 2010.
- M. Sahnoun, P. Vialletelle, S. Bassetto, S. Bastoini, M. Tollenaere “*Optimizing Return On Inspection Trough Defectivity Smart Sampling*” the 17th IEEE International Symposium on Semiconductor Manufacturing, ISSM2010, Tokyo, Japan, October 18-20, 2010
- M. Sahnoun, G. Bourhis, “*Assisted Control Mode for a Smart Wheelchair,*” Rehabilitation Robotics, 2007. ICORR 2007. IEEE 10th International Conference on , vol., no., pp.158-163, 13-15 June 2007, DOI: 10.1109/ICORR.2007.4428422
- M. Sahnoun, G. Bourhis. “*Assisted control for powered wheelchair with a force feedback joystick*” _, in Association for the Advancement of Assistive Technology in Europe (AAATE 2005), IOS Press, p. 601-605, 2005.
- A. Fattouh; M. Sahnoun; G. Bourhis; “*Force feedback joystick control of a powered wheelchair: preliminary study,*” Systems, Man and Cybernetics, 2004 IEEE International Conference on , vol.3, pp. 2640- 2645 10-13 Oct. 2004. DOI:10.1109/ICSMC.2004.1400729
- M. Sahnoun, G. Bourhis, “*Retour haptique pour l'aide au pilotage des fauteuils roulants électriques*”, Colloque Handicap 2006, Paris, juin 2006, p. 34-39.

Project Deliverable(s)

- E.Zamaï, M Sahnoun, M.Bouaziz, F.Duvivier, P.Vialletelle, “Specifications for automatic feeding of process control applications”, (IMPROVE-WP4-D4-1-1), 15/02/2010
- M.Sahnoun, B.Bettayeb, P.Vialletelle “Validation of Target Control Plan v2 - specs for further integration”, (IMPROVE-WP4-D4-2-5), 20/03/2012.

References:

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