

Fayçal MOUNAIM, Ph.D.

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Education

Electrical Engineering – Microelectronics

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|-----------|----------------|---|-------------------|
| 2007-2013 | Ph.D | Ecole Polytechnique / Polystim Lab. | Montreal, Canada. |
| 2003-2006 | M.Sc.A, | | |
| 2000 | B.Eng, | INSA (National Institute of Applied Sciences) | Lyon, France. |

Experience

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|--------------------------|--|--|-------------------|
| 2003-2013 | M.Sc.A & Ph.D | Ecole Polytechnique / Polystim Lab. | Montreal, Canada. |
| | <u>Project:</u> | Highly-integrated neurostimulator and new stimulation strategy to improve micturition in paraplegics | |
| | <ul style="list-style-type: none">○ Defined new requirements with neurosurgeons and urologists.○ Proposed solutions to previous prototypes limitations.○ Implemented new functionalities such as telemetry and battery recharge.○ Improved encapsulation and packaging techniques.○ Designed several prototypes using discrete components.○ Validated prototypes with animal experiments.○ Patented a new stimulation strategy.○ Proposed a new inductive power recovery front-end for better power efficiency.○ Implemented this front-end in high-voltage CMOS 0.8um technology.○ Designed a miniature prototype based on custom HV ICs.○ Collaborated in the design of several ICs in CMOS 0.18um technology.○ Supervised about 30 interns, coached 10 M.Sc.A/1 Ph.D students.○ Taught "Electronics for communication" course.○ Supervised "Analog & Mixed Microelectronics" course lab.○ Presented papers in several conferences. | | |
| 2006 (3months) | Analog Test Engineer | LTRIM Technologies inc. | Laval, Canada. |
| | <ul style="list-style-type: none">○ Tested and characterized analog integrated circuits dedicated to power management.○ Elaborated and analysed test plans. | | |
| 2004-2005 (12 months) | Research Associate | Ecole Polytechnique / Polystim Lab. | Montreal, Canada. |
| | Design Leader | Victhom Human Bionics Inc. | Quebec, Canada. |
| | <u>Project:</u> | Technology transfer of an implantable bladder neurostimulator prototype. | |
| | <ul style="list-style-type: none">○ Formed and managed a team of 3 M.Sc.A student/1 technician.○ Managed and planned a challenging 6-month project.○ Reviewed and studied past system architectures.○ Defined new specifications with client.○ Developed a new architecture.○ Selected appropriate components based on specifications and constraints.○ Designed analog parts and supervised digital and PCB designs.○ Tested, debugged and delivered functional prototypes on time.○ Documented design and transferred technology knowledge. | | |

- 2000-2003 (28 months) **Design Engineer, PHILIPS Semiconductors** Caen, France.
 Analog RF, Microelectronics Circuits and Systems,
 Development of RF integrated de circuits dedicated to TV tuners.
Project: Cable Fully Integrated Silicon Tuner 50-900MHz
- Position I** Product: TDA8270
- Project transfer from Philips Natlab research center (6 months) Eindhoven, Holland.
 - **Designed and developed key analog building blocks.**
 - Optimized architecture and RF/PLL interface.
 - Transferred knowledge and completed product within Caen design team.
 - Evaluated and tested the fabricated product (PCB, measurements and characterisation).
 - Investigated and resolved challenging issues (simulations and theoretical analysis).
 - Participated in product qualification plan.
 - Conducted meetings and presented achieved results to more than 50 people.
- Position II** Product: TDA8272
- Participated in definition of new specifications.
 - **Reviewed and improved system design approaches.**
 - Documented design and technical know-how.
 - Coached layout, test, and PCB technicians, and supervised interns.
 - Cooperated with internal and external clients and collaborators.
- 2000 (6 months) Final year project, **INSA / PHILIPS Semiconductors** Lyon, France.
 Researched and studied new technology solutions for higher integration of TV tuners.
- 1999 (2 months) Intern, **Ecole Polytechnique / Polystim Lab.** Montreal, Canada.
 Designed an integrated low-frequency oscillator for implantable devices.
- 1998 (1 month) Intern, **ST-Microelectronics** Casablanca, Morocco.
 Programmed a microprocessor-based control unit for production line monitoring.

Professional training courses

- 2010 (3 days) **Cadence - RF System-in-Package Methodology**, CMC Microsystems.
- 2002 (1 week) **Modern Analog Electronics: HF & IF Techniques**, Philips CTT.
 Architectures of receiver systems, System design aspects, Novel integrated architectures,
 Basic properties of RF circuits, Noise and Non-linear distortion, Passive and RC Active filters,
 Fixed and Tuned filters, Oscillators, Mixers, Synthesizers.
- 2002 (1 week) **Cadence - Spectre RF v4.4.3**
- 2001 (1 week) **Agilent - Technologies ADS v1.5**
 Advanced Design System Fundamentals & Communication Systems Design
 Circuit simulation fundamentals, Circuit modeling, Parameter tuning and optimization.
 S-Parameters, Harmonic Balance, Envelope Simulation, System design and co-simulation.
- 2001 (1 day) **Philips ED&T - Adapt v3.0**,
 Optimization to reach design specifications over process, temp. & power supply variations.

Software tools

Cadence Environment and Tools (Spectre RF, Layout XL, DRC, LVS, SPW...), ADS, Matlab.
 MS-Office, MS-Visio, MS-Project.

Activities / Interests

Amateur astronomy, electronics, photography, reading.
 Biking, running, swimming, skating, soccer, most racquet games, and Kung-fu.

Publications

Journal papers with reviewing committee:

- [1] F. Mounaim and M. Sawan, "Toward A Fully Integrated Neurostimulator With Inductive Power Recovery Front-End," Biomedical Circuits and Systems, IEEE Transactions on , vol.6, no.4, pp.309-318, Aug. 2012.
- [2] F. Mounaim and M. Sawan, "Integrated high-voltage inductive power and data-recovery front end dedicated to implantable devices," Biomedical Circuits and Systems, IEEE Transactions on, vol. 5, no. 3, pp. 283-291, June 2011.
- [3] F. Mounaim, E. Elzayat, M. Sawan, J. Corcos, and M.M. Elhilali, "New neurostimulation and blockade strategy to enhance bladder voiding in paraplegics," Contemporary Engineering Sciences, Hikari Ltd, vol. 3, no. 7, pp. 321–337, Sept. 2010.

Book chapter:

- [4] F. Mounaim and M. Sawan, "New neurostimulation strategy and corresponding implantable device to enhance bladder functions," in Biomedical Engineering, Trends in Electronics, Communications and Software, Anthony Laskovski, Ed.: InTech, 2010.

Patent:

- [5] F. Mounaim and M. Sawan, "Sacral neurostimulation to induce micturition in paraplegics," Patent application number US 12/886,552, Sep. 2010.

Conference papers with reviewing committee:

- [6] F. Mounaim and M. Sawan, "High-voltage DC/DC converter for high-efficiency power recovery in implantable devices," in Microelectronics (ICM), 2009 International Conference on, Marrakech, 2009, pp. 22-25.
- [7] F. Mounaim, M. Sawan, and M. El-Gamal, "Integrated inductive power and data recovery front-end dedicated to implantable devices," in Biomedical Circuits and Systems Conference. BioCAS. IEEE, Beijing, 2009, pp. 229-232.
- [8] F. Mounaim, E. Elzayat, M. Sawan, J. Corcos, and M.M. Elhilali, "New sacral neurostimulation strategy to enhance micturition in paraplegics: Acute dog experiments," in Proc. 13th Ann. Int. Conf., Freiburg, 2008, pp. 22-24.
- [9] F. Mounaim, M. Sawan, and M. El-Gamal, "Fully-integrated inductive power recovery front-end dedicated to implantable devices," in Biomedical Circuits and Systems Conference. BioCAS. IEEE, Baltimore, 2008, pp. 105-108.
- [10] F. Mounaim, M. Sawan, and S. Bedard, "Implantable neuro-monito-stimulation system dedicated to enhance the bladder functions," in Biomedical Circuits and Systems Conference. BioCAS. IEEE, London, 2006, pp. 198-201.
- [11] F. Mounaim and M. Sawan, "Implantable Electronic Device Dedicated to Neural Stimulation and Sensing," Computer Architecture for Machine Perception and Sensing. CAMP. International Workshop on, Montreal, 2006, pp.196-197.
- [12] F. Mounaim, Y. Laaziri, G. Lesbros, P. Nadeau, É. Bharucha, M. Sawan, and S. Bédard, "Implantable neurostimulator for bladder rehabilitation in paraplegics," in 10th Annual Conference of the International Functional Electrical Stimulation Society (IFESS), Montreal, 2005.
- [13] F. Mounaim, Y. Laaziri, D.P.-Ferron, and M. Sawan, "Continuous and selective neurostimulation techniques to recuperate the bladder functions," National Spinal Cord Rehab Conference, Toronto, 2004.

Honors / Awards

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| 2010 | Grand Prize for Innovation and Vulgarization contest at ACFAS congress. |
| 2007 - 2010 | NSERC (Canada) 3 years Ph.D scholarship and several ReSMiQ/Polytechnique awards. |
| 2006 & 2010 | Best graduate presentation at IEEE-Poly conference. |
| 2001 | Royal Philips Electronics Award: SILVER Design of the year. |
| 1997 - 2000 | National (Morocco) merit scholarship |