FURKAN ERCAN

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EDUCATION

McGill University October 2020
Degree: Ph.D. in Electrical & Computer Engineering
Research: Practical and Energy-Efficient 5G Polar Decoder Algorithms & Implementations

Middle East Technical University June 2015
Degree: M.Sc. in Sustainable Environment & Energy Systems
Research: Energy-Efficient Arithmetic Multiplier VLSI Architecture & Design

Middle East Technical University June 2011
Degree: B.Sc. in Electrical & Electronics Engineering (1^{st} rank in the Department)

EXPERIENCE

Octasic Inc. June 2020 - Present
5G PHY Algorithm Developer *Montréal, QC, Canada*

- Design and optimization of 5G Wireless Protocol Systems, including development of MATLAB reference models to optimized embedded C/ASM DSP implementations.
- Development of the full 5G polar decoder encoder and decoder chain in downlink and uplink channels in Matlab, C and Assembly.
- Optimization of the polar decoder at algorithm and assembly implementation levels, making it flexible and several orders of magnitude faster than existing inhouse solutions.
- Experience PDCCH, PBCH, PUCCH channels in 5G PHY as well as LDPC codes.
- Personal track record on fast learning, taking initiative, adaptation to new challenges, Agile framework, efficient debugging.

McGill University September 2015 - August 2020
Teaching Assistant *Montréal, QC, Canada*

- Designed and performed tutorials & labs for Computer Organization, Digital System Design, Digital Logic courses.
- Received the Faculty Outstanding Teaching Assistant Award 2018.
- Appointed as a Research Assistant for designing the course/laboratory material for the Digital Systems course.

Middle East Technical University September 2012 - June 2015
Teaching & Research Assistant *Ankara, Turkey*

- Designed and performed tutorials & labs for Digital Logic Design, Analog & Digital Electronics, Computer Architecture and VLSI Design courses.
- Served as a Research Assistant for a project involving design and implementation of threshold logic circuits using various technologies.
- Designed, fabricated and measured a scalar multiplier ASIC chip in TSMC 180nm CMOS using Cadence tools.

Intel Labs July 2011 - July 2012
Graduate Intern Technical *Hillsboro, OR, USA*

- Created a system-level energy-aware dynamic voltage/frequency scaling (DVFS) management policy that manages the CPU and memory resources in an integrated fashion.
- Work with the Emerald Lake 2 platform at Client Platform Integration Lab and identified kernel driver incompatibilities and software resources of various operating systems.
- Extended a memory DVFS tool for real-time CPU, uncore and memory statistics output.
- Experience with Intel server/PC architecture platforms, SPEC CPU 2006 benchmark.

ASELSAN Summer 2010
Summer Intern *Ankara, Turkey*

- Data transfer optimization on military radio products on MATLAB.

TECHNICAL STRENGTHS

Languages	C/C++, VHDL, LaTeX, Perl, MATLAB, Assembly
Tools & Platforms	ASIC, FPGA, Quartus, Xilinx, Visual Studio, ModelSim, Cadence, Linux, Git, SVN, Agile, Application Specific Design & Integration Tools

RECENT PUBLICATIONS

1. **F. Ercan**, T. Tonnellier, N. Doan, W. J. Gross, "Practical Dynamic SC-Flip Polar Decoders: Algorithm and Implementation", in *IEEE Transactions on Signal Processing (TSP)*, vol. 68, pp. 5441-5456, September **2020**.
2. **F. Ercan**, T. Tonnellier, and W. J. Gross, "Energy-Efficient Hardware Architectures for Fast Polar Decoders,", in *IEEE Transactions on Circuits and Systems I - Regular Papers (TCAS-I)*, **2020**.
3. S. M. Abbas, T. Tonnellier, **F. Ercan**, M. Jalaleddine and W. J. Gross, "High-Throughput VLSI Architecture for Soft-Decision Decoding with ORBGRAND", *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, **2021**.
4. N.Doan, S. A. Hashemi, **F. Ercan**, T. Tonnellier, W. J. Gross, "Neural Successive Cancellation Flip Decoding of Polar Codes", *Journal of Signal Processing Systems*, vol. 93, pp. 631–642, **2021**.
5. **F. Ercan**, W. J. Gross, "Fast Thresholded SC-Flip Decoding of Polar Codes", In: *IEEE International Conference on Communications (ICC)*, Dublin, Ireland, **2020**.
6. **F. Ercan**, C. Condo, and W. J. Gross, "Improved Bit-Flipping Algorithm for Successive Cancellation Decoding of Polar Codes,", *IEEE Transactions on Communications (TCOM)*, vol. 67, no. 1, pp. 61-72, **2019**.

AWARDS

2020 IEEE Communications Society Student Grant Award for ICC 2020.

2020 Third place in the province at Quebec Engineering Competition Graduate Research Track.

2019 First place award at McGill Engineering Competition Graduate Research Track for the oral presentation featuring "Energy-efficient hardware architectures for fast polar decoders".

2019 Second place award at 6^{th} IEEE Montreal Research Boost for the poster presentation titled "Energy-efficient polar decoders for 5G and beyond".

2018 Outstanding Teaching Assistant Award from the Faculty of Engineering, McGill University for tutoring Digital System Design course.

2018 Graduate Research Enhancement and Travel (G.R.E.A.T) award for conference proceeding to be presented in IEEE Wireless Communications and Networking Conference (WCNC), Barcelona, Spain.

2017 Exemplary Student Branch Award for chairing McGill IEEE Student Branch.

2015 McGill Engineering Doctoral Award (Roger Boudreault Doctoral Fellowship).

2015 Best Paper Award in 5th International Conference on Energy Aware Computing Systems & Applications (ICEAC) 2015, Cairo, Egypt.

2007-2011 Several High Honour degrees for excellence throughout the undergraduate degree.

PROFESSIONAL VOLUNTEERING & LEADERSHIP

Ongoing Vice-Chair of IEEE Montreal Section.

Ongoing Reviewer for numerous top-tier international conferences and journals in multiple fields such as Wireless Communications, Circuits & Systems, Digital Signal Processing.

2021 Lead organizer and panelist of IEEE Montreal Section Keynote Event 2021.

2021 Technical Organization Committee at IEEE ICC 2021 Women in Engineering Panel.

2018 Volunteer instructor at Montréal Turkish Community Center for pre-college education.

2017 Volunteer coordinator in 5^{th} IEEE Global Conference on Signal and Information Processing Conference.

2016 Chair of McGill IEEE Student Branch.

2013 Graduate Program Student Delegate at Middle East Technical University NCC.

2012 Technical organization of 3^{th} IEEE International Conference on Energy Aware Computing Systems.

2011 Founded and chaired IEEE METU NCC Student Branch.

2010 Technical organization of Mediterranean Microwave Symposium (MMS).

REFERENCES

	Affiliation	Email	Reference for
Jonathan Labs	Tech. Manager, Octasic	jonlabs@gmail.com	5G Algo Developer
Prof. Warren Gross	McGill University	warren.gross@mcgill.ca	Ph.D. Studies
Prof. Ali Muhtaroglu	METU	amuhtar@metu.edu.tr	M.Sc. Studies
Prof. Boris Vaisband	McGill University	boris.vaisband@mcgill.ca	Teaching Assistant
Prof. Frank Ferrie	McGill University	frank.ferrie@mcgill.ca	Teaching Assistant
Prof. Fabrice Labeau	McGill University	fabrice.labeau@mcgill.ca	IEEE Activities