

FURKAN ERCAN

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EDUCATION

McGill University October 2020

Ph.D., Electrical & Computer Engineering

Research: Polar Code Decoder Algorithms & Implementations for 5G Wireless Communications

Middle East Technical University June 2015

M.Sc., Sustainable Environment & Energy Systems

Research: Energy-Efficient Arithmetic Multiplier VLSI Architecture & Design

Middle East Technical University June 2011

B.Sc., Electrical & Electronics Engineering (1st Rank in Department)

WORK EXPERIENCE

Boston University (in collaboration with MIT) November 2021 - present
Postdoctoral Associate Boston, MA, USA

- Algorithms, software development & hardware implementations for next-generation universal decoding algorithms.
- Physical layer security algorithm development in software against jamming and interference.
- Application-specific in-memory computing architecture & circuit design.

Octasic Inc. June 2020 - August 2021
5G PHY Senior 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 encoder and decoder chain in downlink and uplink channels.
- Optimization of the polar decoder at multiple levels, making it flexible and several orders of magnitude faster than existing in-house solutions.
- Experience in PDCCH, PBCH, PUCCH channels in 5G PHY as well as LDPC codes.

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

- Designed and conducted lectures, tutorials & labs for Computer Organization, Digital System Design, Digital Logic.

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

- Designed and performed tutorials & labs for Digital Logic, Analog & Digital Electronics, Computer Architecture, VLSI Design courses.

Intel Corporation July 2011 - July 2012
Graduate Intern Hillsboro, OR, USA

- System-level energy-aware power management policy description, implementation and verification on Nehalem architecture targeting CPUs and RAMs.
- Hands-on experience with Intel server/PC architecture platforms, SPEC CPU benchmark.

ASELSAN Summer 2010
Summer Intern Ankara, Turkey

- Wireless signal processing software optimization on military radio products.

TECHNICAL STRENGTHS

Languages	C/C++, VHDL, \LaTeX , Perl, MATLAB, ASM
Tools & Platforms	ASIC, FPGA, Quartus, Xilinx, Visual Studio, ModelSim, Cadence, Linux, Git, SVN, Agile

SELECTED PUBLICATIONS

1. **F. Ercan**, T. Tonnellier, N. Doan, W. J. Gross, "Practical Dynamic SC-Flip Decoders: Algorithm and Implementation", In: *IEEE Transactions on Signal Processing (TSP)*, October 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)*, Oct. 2019.
3. **F. Ercan**, C. Condo, and W. J. Gross, "Improved Bit-Flipping Algorithm for Successive Cancellation Decoding of Polar Codes," *IEEE Transactions on Communications (TCOM)*, Jan. 2019.
4. S. M. Abbas, T. Tonnellier, **F. Ercan**, M. Jaleddine, W. J. Gross, "High-Throughput and Energy-Efficient VLSI Architecture for Ordered Reliability Bits GRAND", In: *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, June 2022.
5. A. Riaz, A. Solomon, **F. Ercan**, M. Medard, K. R. Duffy, and R. T. Yazicigil, "Interleaved Noise Recycling using GRAND", IEEE International Conference on Communications (ICC), 2022.

LEADERSHIP & PROFESSIONAL ACTIVITIES

Ongoing Active member of [IEEE Wireless Communications Technical Committee](#).
Ongoing Technical Committee Co-Chair of [IEEE Future Networks World Forum 2022](#).
Ongoing Technical Program Chair of [IEEE Vehicular Technology Conference - 2022 Spring](#).
Ongoing Reviewer for numerous top-tier international conferences and journals in multiple fields such as Wireless Communications, Circuits & Systems, Digital Signal Processing.
2021 Vice-Chair of [IEEE Montreal Section](#).
2021 Demos & Exhibits Co-Chair of [IEEE 5G World Forum 2021](#).
2021 Lead organizer and panelist of [IEEE Montreal Section Keynote Event 2021](#).
2021 Technical Organization Committee at [IEEE ICC 2021 Women in Engineering Panel](#).
2017 Volunteer coordinator in 5th IEEE Global Conference on Signal and Information Processing Conference.
2016 Chair of [McGill IEEE Student Branch](#).
2013 Graduate Program Student Representative at Middle East Technical University NCC.
2012 Technical organization of 3th IEEE International Conference on Energy Aware Computing Systems.
2011 Founder and chair of [IEEE METU NCC Student Branch](#).
2010 Technical organization of Mediterranean Microwave Symposium (MMS).

RECENT AWARDS

2021 Exemplary Keynote Organization Award by the IEEE Montreal Section.
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 6th 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 (GREAT) 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.

RESOURCES

[Personal Webpage](#) / [LinkedIn](#) / [Google Scholar](#) / [ResearchGate](#)