Furkan Ercan

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EXPERIENCE

Intel

Staff Research Scientist/Engineer

Boston, MA, USA | Dec 2022 - current

- Led the development of algorithms, signal processing and RTL for DARPA's Space-BACN, enhancing error correction systems for space-based communications.
- Optimized multi-mode forward error correction architectures for OpenZR+, LCRD, and 5G SDA, achieving 10+ Gbps on Intel 3 process with low power usage.
- Led the design of high-performance receiver subsystems, achieving a 90% reduction in RTL development efforts and saving 6+ engineering months.
- Filed patents on cutting-edge wireless and optical communication technologies focused on error correction codes.

Boston University

Postdoctoral Associate

Boston, MA, USA | Nov 2021 - Dec 2022

- Managed development and validation of first universal decoder microchip to reach <1 pJ/bit efficiency with a 16 Gbps throughput, optimizing for ultra low-energy use.
- Created a configurable C++ reference model for GRAND algorithm family, enhancing hardware testing speed by 25% and memory/runtime optimization by 90%.
- Developed innovative security algorithms improving error correction by 1000x in jamming scenarios at no extra cost.
- Had lead and mentor roles in an interdisciplinary team across academics from MIT (USA) and Maynooth University (Ireland).

Octasic

5G PHY Algorithm Developer

Montréal, QC, Canada | Jun 2020 - Aug 2021

- Spearheaded 5G PHY optimization, achieving a 2000-fold reduction in channel latency through strategic algorithm/SDR enhancements for an embedded platform.
- Worked on critical 5G PHY components, including PDCCH, PBCH, PUCCH channels, and reduced memory use of LDPC decoders by 20%.
- Led the development of 5G polar encoder and decoder chain, accelerating data transmission speeds for both downlink and uplink channels.

SKILLS

- Wireless/Optical Communications
- PHY Development
- Systems Engineering
- Algorithm Development
- DSP Architectures
- Embedded Platforms
- Error Correcting Codes
- Reference Modeling
- Git/SVN
- C/C++
- MATLAB/Simulink
- ASIC/FPGA
- Machine Learning

EDUCATION

Ph.D.

Electrical & Computer Engineering

McGill University

2020

M.Sc.

Sustainable Environment & Energy Systems

Middle East Technical University

2015

B.Sc.

Electrical & Electronics Engineering

Middle East Technical University

2011

- 1st Rank, Dean's List

McGill University

Research & Teaching Assistant

Montréal, QC, Canada | Sep 2015 - Oct 2020

- Pioneered polar decoding algorithms boosting error correction efficiency by >1 dB and reduced computational complexity >10 times.
- Engineered a C++ framework for advanced polar decoders with bit-exact quantization and improving hardware debugging efficiency by 75%.
- Developed advanced polar decoder architectures, tripling energy efficiency and boosting throughput by 10x over leading designs.

Intel

Graduate Intern - Middle East Energy Research Program

Hillsboro, OR, USA | Jul 2011 - Jul 2012

- Engineered and applied power management strategies that reduced server energy consumption by 10% and decreased memory use by 5%.

RECOGNITION & LEADERSHIP

- Intel IDP and Patent Awards for key contributions in Space-BACN.
- Achievements on universal decoding featured in MIT News and BU News.
- Chairmanship of 12+ professional communities and events.
- 30+ journal papers and proceedings in top-tier venues.
- 200+ reviewer duties for 40+ top-tier journals and flagship conferences.
- 2 Best Paper Awards in IEEE conferences.
- 6 scholarship and grant awards throughout the Ph.D. degree.
- Best Teaching Assistant Award, McGill Faculty of Engineering.
- Exemplary Branch Award during chairmanship of the McGill IEEE Branch.
- Graduated with first rank and Dean's List honors in B.Sc. degree.

OUTREACH

- Associate Editor in IEEE Communications Letters.
- Guest Editor in VLSI Architectures for Wireless Communications and Digital Signal Processing.
- Member of IEEE Wireless Communications Technical Committee.
- Reviewer for top-tier conferences and journals.
- Program Chair of IEEE Vehicular Technology Conference (2022-2024).
- Committee Co-Chair of IEEE Future Networks World Forum (2021-2023).
- Vice-Chair of IEEE Montreal Section (2021-2022).
- Children's Culture Ambassador for Montréal Türkiye Community Center.

EXTRACURRICULAR

- Nature photography
- Literary writing
- Hiking and running