Nghia Doan **Last update: October 5, 2021**

CONTACT INFORMATION

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EDUCATION

McGill University, Montréal, Quebéc, Canada — 2017–2022 (expected)

- Ph.D. in Electrical and Computer Engineering, GPA: **3.4/4.0**.
- Advisor: Professor Warren Gross.

Seoul National University, Seoul, South Korea — 2015–2017

- MSc in Electrical and Computer Engineering, GPA: **3.9/4.3**.
- Advisor: Professor Hyuk-Jae Lee.

Posts & Telecommunications Institute of Technology, Hanoi, Vietnam — 2009–2014

- B.Eng. in Electrical and Computer Engineering, GPA: **8.7/10.0** (top of class).

HONORS AND AWARDS

- ***McGill Engineering Doctoral Award*** — 2017
- ***A-san Foundation Scholarship*** — 2016
- ***Samsung Electronics Award*** — 2015
- ***Scholarships for Academic Excellent*** — 2009-2014

TECHNICAL SKILLS

- *Programming Languages*: C/C++, Python, Assembly, VHDL.
- *Softwares and Libraries*: PyTorch, TensorFlow, MATLAB, OpenCV.

RESEARCH TOPICS

- **High-Performance Decoding of Short Linear Block Codes with Machine Learning** 2017–present
  Utilizing state-of-the-art machine learning techniques in the design of high-performance decoding algorithms for short linear block codes, which are targeted for 5G-and-beyond communications standards.
- **Abnormal Pedestrian Detection Using Surveillance Video Data** 2016–2017
  Design an automated deep learning algorithm that can detect abnormal behaviors of pedestrians including entering prohibited area, running, and moving with abnormal directions.
- **Hardware-Friendly Encoding Algorithms of High-Efficiency Video Coding (HEVC)** 2015–2016
  Design a hardware-friendly integer motion estimation engine used in the HEVC standard.

SELECTED PUBLICATIONS

Book Chapter

1. W. J. Gross, N. Doan, E. N. Mambou, and S. A. Hashemi, "Deep Learning Techniques for Decoding Polar Codes", Wiley, 2019.

Journal Papers

1. N. Doan, S. A. Hashemi, and W. J. Gross, "Efficient Soft-Input Soft-Output Decoding of CRC-Polar Concatenated Codes", IEEE Communications Letters, **under preparation**.
2. N. Doan, S. A. Hashemi, and W. J. Gross, "Decoding Reed-Muller Codes with Successive Factor-Graph Permutations", IEEE Transactions on Communications, **submitted**.
3. N. Doan, S. A. Hashemi, and W. J. Gross, "Successive-Cancellation Decoding of Reed-Muller Codes with Fast Hadamard Transform", IEEE Transactions on Vehicular Technologies, **submitted**.
4. N. Doan, S. A. Hashemi, and W. J. Gross, "Fast Successive-Cancellation List Flip Decoding of Polar Codes", IEEE Access, **submitted**.
5. N. Doan, S. A. Hashemi, F. Ercan, T. Tonnellier, and W. J. Gross, "Neural Successive-Cancellation Flip Decoding of Polar Codes", Journal of Signal Processing Systems, 2020.

6. F. Ercan, T. Tonnellier, N. Doan, W. J. Gross, "Practical Dynamic SC-Flip Polar Decoders: Algorithm and Implementation", IEEE Transactions on Signal Processing, 2020.
7. N. Doan, T. S. Kim, C. E. Rhee, and H.-J. Lee, "A hardware-oriented concurrent TZ search algorithm for High-Efficiency Video Coding", EURASIP Journal on Advances in Signal Processing, 2017.
8. N. Doan, S. Kim, L. C. Vo, and H.-J. Lee, "Anomalous Trajectory Detection in Surveillance Systems Using Pedestrian and Surrounding Information", IEIE Transactions on Smart Processing and Computing, 2016.

Conference Papers

1. S. A. Hashemi, N. Doan, W. J. Gross, J. Cioffi, and A. Goldsmith, "A Tree Search Approach for Maximum-Likelihood Decoding of Reed-Muller Codes", IEEE Globecom: Workshop on Channel Coding beyond 5G, Madrid, Spain, 2021 (to appear).
2. N. Doan, S. A. Hashemi, F. Ercan, and W. J. Gross, "Fast SC-Flip Decoding of Polar Codes with Reinforcement Learning", IEEE International Conference on Communications (ICC), Montreal, Canada, 2021.
3. T. Tonnellier, M. Hashemipour, N. Doan, W. J. Gross, and A. Balatsoukas-Stimming, "Towards Practical Near-Maximum-Likelihood Decoding of Error-Correcting Codes: An Overview", IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Toronto, Canada, 2021.
4. N. Doan, S. A. Hashemi, and W. J. Gross, "Decoding of Polar Codes with Reinforcement Learning", IEEE Global Communications Conference (GLOBECOM), Taipei, Taiwan, 2020.
5. F. Ercan, T. Tonnellier, N. Doan, and W. J. Gross, "Simplified Dynamic SC-Flip Polar Decoding", IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Barcelona, Spain, 2020.
6. N. Doan, S. A. Hashemi, F. Ercan, T. Tonnellier, and W. J. Gross, "Neural Dynamic Successive Cancellation Flip Decoding of Polar Codes", IEEE International Workshop on Signal Processing Systems (SiPS), Nanjing, China, 2019.
7. N. Doan, S. A. Hashemi, E. N. Mambou, T. Tonnellier, and W. J. Gross, "Neural Belief Propagation Decoding of CRC-Polar Concatenated Codes", IEEE International Conference on Communications (ICC), Shanghai, China, 2019.
8. N. Doan, S. A. Hashemi, M. Mondelli, and W. J. Gross, "On the Decoding of Polar Codes on Permuted Factor Graphs", IEEE Global Communications Conference (GLOBECOM), Abu Dhabi, UAE, 2018.
9. S. A. Hashemi, N. Doan, and W. J. Gross, "Deep-Learning-Aided Successive-Cancellation Decoding of Polar Codes", Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, USA, 2019.
10. S. A. Hashemi, N. Doan, M. Mondelli, and W. J. Gross, "Decoding Reed-Muller and Polar Codes by Successive Factor Graph Permutations", IEEE International Symposium on Turbo Codes & Iterative Information Processing (ISTC), Hong Kong, China, 2018.
11. N. Doan, S. Ali Hashemi and W. J. Gross, "Neural Successive Cancellation Decoding of Polar Codes", IEEE 19th International Workshop on Signal Processing Advances in Wireless Communications (SPAWC), Kalamata, Greece, 2018.
12. N. Doan, T. S. Kim, H.-J. Lee, and S. I. Chae, "A modified TZ search algorithm for parallel integer motion estimation in high efficiency video coding", IEEE International SoC Design Conference (ISOCC), Gyeongju, South Korea, 2015.

References

Prof. **Warren Gross**
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Dr. **Seyyed Ali Hashemi**
Qualcomm, San Diego, California, USA
E-mail: hashemi@qti.qualcomm.com