REFERENCES

[1] Ericsson, "Ericsson Mobility Report," Tech. Rep., November 2015.

[2] ITU-R, "IMT Vision Framework and overall objectives of the future development of IMT for 2020 and beyond," Tech. Rep., September 2015.

[3] Ericsson, "5G Radio Access," Tech. Rep., April 2016.

[4] E. Yaacoub, M. Husseini, and H. Ghaziri, "An Overview of Research Topics and Challenges for 5G Massive MIMO Antennas," in *2016 IEEE Middle East Conference on Antennas and Propagation (MECAP)*, Beirut, Lebanon, September 2016.

[5] Y. Cui, X. Fang, and L. Yan, "Hybrid Spatial Modulation Beamforming for mmWave Railway Communication Systems," *IEEE Transactions ON Vehicular Technology*, vol. 65, no. 12, pp. 9597 – 9606, December 2016.

[6] P. R. M., S. G., A. Kumar, and K. Kuchi, "Novel Rate Matching Scheme for Downlink Control Channel in 3GPP Massive Machine Type Communications," in *2018 10th International Conference on Communication Systems and Networks (COMSNETS)*. Bengaluru, India: IEEE, April 2018, pp. 183–190.

[7] B. Tahir, S. Schwarzy, and M. Ruppz, "BER Comparison Between Convolutional, Turbo, LDPC, and Polar Codes," in *2017 24th International Conference on Telecommunications (ICT)*. Limassol, Cyprus: IEEE, May 2017.

[8] T. K. Akino, Y. Wang, S. C. Draper, K. Sugihara, and W. Matsumoto, "Bit-Interleaved Polar-Coded OFDM for Low-Latency M2M Wireless Communications," in *IEEE ICC 2017 Wireless Communications Symposium*. Paris, France: IEEE, July 2017, pp. 1–7.

[9] 3GPP, "Evolved Universal Terrestrial Radio Access (E-UTRA); Multiplexing and channel coding," 3rd Generation Partnership Project (3GPP), TS 36.212, 2016.

[10] G. Liva, "Graph-based analysis and optimization of contention resolution diversity slotted ALOHA," *IEEE Trans. on Communications*, vol. 59, no. 2, pp. 477–487, February 2011.

[11] K. Anwar, "Graph-based Decoding for High-Dense Vehicular Multiway Multirelay Networks," in *IEEE Vehicular Technology (VTC)-Spring 2016*, Nanjing, China, May 2016, pp. 1–8.

[12] M. N. Hasan and K. Anwar, "Massive Uncoordinated Multiway Relay Networks with Simultaneous Detections," in *IEEE International Conf. on Comm. Workshop (ICCW)*, London, UK, June 2015, pp. 2175–2180.

[13] K. Anwar and M. N. Hasan, "Uncoordinated Transmissions in Multi-way Relaying Systems," in *ITG Conference on Systems, Communications and Coding (SCC)*, Hamburg, Germany, February 2015, pp. 1–5.

[14] A. A. Purwita and K. Anwar, "Massive Multiway Relay Networks Applying Coded Random Access," *IEEE Transaction on Communications*, vol. 64, no. 10, pp. 4134 – 4146, October 2016.

[15] K. Anwar, Juansyah, B. Syihabuddin, and N. M. Ardiansyah, "Coded Random Access with Simple Header Detection for Finite Length Wireless IoT Networks," in *2017 Eighth International Workshop on Signal Design and Its Applications in Communications (IWSDA)*. Sapporo, Japan: IEEE, October 2017.

[16] Juansyah and K. Anwar, "Header Detection for Massive IoT Wireless Networks over Rayleigh Fading Channels," in *2017 International Conference on Signals and Systems (ICSigSys)*. Sanur, Indonesia: IEEE, May 2017.

[17] 3rd Generation Partnership Project, "Cellular System Support for Ultra-low Complexity and Low Throughput Internet of Things (IoT)," Valbonne, France, TR45.820, August 2015.

[18] I. V. Yuliani and K. Anwar, "Design of LDGM-based Raptor codes for Broadband Internet of Things using EXIT chart," in *2017 International Conference on Signals and Systems (ICSigSys)*, BALI, Indonesia, May 2017, pp. 128–133.

[19] A. Shokrollahi, "Raptor Codes," *IEEE Transaction on Information Theory*, vol. 52, no. 6, pp. 2551–2567, June 2006.

[20] B. W. Khoueiry, "Capacity Approaching Coding Strategies for Machine-to-Machine Comunication in IoT Networks," Ph.D. dissertation, Concordia University, Canada, 2016.

[21] M. G. Luby, M. Mitzenmacher, and M. A. Shokrollahi, "Analysis of Random Processes via AND-OR Tree Evaluation," in *In Proceedings of the 9th Annual ACM-SIAM Symposium on Discrete Algorithms*, San Francisco, California, USA, January 1998, pp. 364–373.

[22] 3GPP, "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; NR; Physical Channels and Modulation (release 15)," TS 38.211, Tech. Rep., December 2017.

[23] V. Roca and C. Neumann, "Design, Evaluation, and Comparison of Four Large Block FEC Codecs, LDPC, LDGM, LDGM Staircase, and LDGM Triangle, Plus a Reed Solomon Small Block FEC Codec," INRIA, Tech. Rep. RR-5225, June 2004.

[24] M. Alfaroby, N. M. Adriansyah, and K. Anwar, "Study on Channel Model for Indonesia 5G Networks," in *2018 International Conference on Signals and Systems (ICSigSys)*, Bali, Indonesia, May 2018.

[25] M. Luby, "LT Codes," *the 43rd IEEE FOCS*, pp. 271–280, November 2002.

[26] ——, "Raptor Codes Application Layer FEC." Maui, Hawaii: International Conference on Computing, Networking and Communications, January 2012.

[27] A. I. Adedapo, M. Mjumo, and N. Guillaume, "Performance Analysis of Raptor Code-based IEEE 802.16e System with Different Modulation Techniques." Arusha, Tanzania: Pan African International Conference on Science, Computing and Telecommuniation, July 2014.

[28] I. Hussain, "Analysis and Design of Rateless Codes," Ph.D. dissertation, KTH School of Electrical Engineering, Stockholm, Sweden, November 2014.

[29] A. Ashikhmin, G. Kramer, and S. T. Brink, "Extrinsic Information Transfer Functions: Model and Erasure Channel Properties," *IEEE Transaction Information and Theory*, vol. 50, no. 11, pp. 2657–2673, November 2004.

[30] S. ten Brink, G. Kramer, and A. Ashikhmin, "Design of Low-Density Parity-Check Codes for Modulation and Detection," *IEEE Transactions on Communications*, vol. 52, no. 4, April 2004.

[31] M. Friedli, L. Kaufmann, F. Paganini, and R. Kyburz, "Energy Efficiency of the Internet of Things," Lucerne University of Applied Sciences, Switzerland, Tech. Rep., April 2016.

[32] 3GPP, "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; NR; Multiplexing and Channel Coding (release 15)," TS 38.212, Tech. Rep., December 2017.

[33] K. Anwar and T. Matsumoto, "Low-complexity Time-concatenated Turbo Equalization for Block Transmission: Part 1 The Concept," *Wireless Personal Communications*, vol. 67, no. 4, pp. 761–781, March 2012.

[34] H. Zhou, K. Anwar, and T. Matsumoto, "Low-complexity Time-concatenated Turbo Equalization for Block Transmission without Guard Interval: Part 2 Application to SC-FDMA," *Wireless Personal Communications*, vol. 67, no. 4, pp. 783–801, December 2012.

[35] P. Elias, "Coding for Two Noisy Channels," in *Proc. 3rd London Symp. Inf. Theory*, London, England, September 1955, pp. 61–76.

[36] S. ten Brink, J. Speidel, and R.-H. Yan, "Iterative Demapping and Decoding for Multi-level Modulation," in *IEEE GLOBECOM*, Sydney, New South Wales, Australia, November 1998.

[37] C. B. Schlegel and L. C. Perez, *Trellis and Turbo Coding*, S. V. Kartalopoulos, Ed. Wiley-Interscience, 2004.

[38] W. R. Ernesto Zimmermann and G. Fettweis, "Forced Convergence Decoding of LDPC Codes EXIT Chart Analysis and Combination with Node Complexity Reduction Techniques," in *Wireless Conference 2005 - Next Generation Wireless and Mobile Communications and Services (European Wireless), 11th European*, Nicosia, Cyprus, April 2005.

[39] H. Harada and R. Prasad, *Simulation and Software Radio for Mobile Communications.* Norwood, MA: USA: Artech House, Inc., 2002.

[40] T. M. Cover and J. A. Thomas, *Elements of Information Theory, 2nd-ed*, Wiley, Ed. Canada: A John Wiley and Sons, inc, January 2006.