

Bounds of E -capacity Region for Multiple-access Channel With Random Parameter*

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Abstract

The discrete memoryless multiple-access channel with random parameter is investigated. Various situations, when the state of the channel is known or unknown on the encoders and decoder, are considered. Some bounds of E -capacity and capacity regions for average error probability are obtained.

References

- [1] R. F. Ahlswede, "Multy-way communication channels", *2nd Intern. Sympos. Inform. Theory. Tsahkadsor, Armenia, 1971*, Budapest: Akad. Kiado, pp. 23–52, 1973.
- [2] R. F. Ahlswede, "The capacity region of a channel with two senders and two receivers", *Annals Probability*, vol. 2. no. 2. pp. 805–814, 1974.
- [3] E. A. Haroutunian, M. E. Haroutunian and A. E. Avetissian, "Multiple-access channel achievable rates region and reliability", *Izvestiya Akademii Nauk Armenii, Matematika*, vol. 27, no. 5, pp. 51–68, 1992.
- [4] M. E. Haroutunian, "On E -capacity region of multiple-access channel", (in Russian) *Izvestiya Akademii Nauk Armenii, Matematika*, vol. 38, no. 1, pp. 3–22, 2003.
- [5] R. G. Gallager, "A perspective on multiaccess channels", *IEEE Trans. Inform. Theory*, vol. 31, no. 1, pp. 124–142, 1985.
- [6] A. G. Dyachkov, "Random constant composition codes for multiple access channels", *Problems of Control and Inform. Theory*, vol. 13, no. 6, pp. 357–369, 1984.
- [7] J. Pokorný and H.M. Wallmeier, "Random coding bound and codes produced by permutations for the multiple-access channel", *IEEE Trans. Inform. Theory*, vol. IT-31, pp. 741–750, 1985.
- [8] Y. S. Liu and B. L. Hughes, "A new universal coding bound for the multiple-access channel", *IEEE Trans. Inform. Theory*, vol. IT-42, pp. 376–386, 1996.

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- [9] S. I. Gelfand, M. S. Pinsker, "Coding for channel with random parameters", *Problems of Control and Inform. Theory*, vol. 8, no. 1, pp. 19–31, 1980.
- [10] E. A. Haroutunian and M. E. Haroutunian, "E-capacity upper bound for channel with random parameter", *Problems of Control and Information Theory*, vol. 17, no.2, pp. 99–105, 1988.
- [11] M. E. Haroutunian, "Bounds of E-capacity for the channel with random parameter", *Problemi Peredachi Informatsii*, (in Russian), vol. 27, no. 1, pp. 14–23, 1991.
- [12] M. E. Haroutunian, "New bounds for E-capacities of arbitrarily varying channel and channel with random parameter", *Trans. IIAP NAS RA and YSU, Mathematical Problems of Computer sciences*, v. 22, p. 44–59, 2001.
- [13] J. Jahn, "Coding of arbitrarily varying multiuser channels", *IEEE Trans. Inform. Theory*, vol. IT-27, no. 2, pp. 212–226, 1981.
- [14] R. F. Ahlswede, Arbitrarily varying channels with states sequence known to the sender, *IEEE Trans. Inform. Theory*, vol. IT-32, no. 5, pp. 621–629, 1986.
- [15] R. F. Ahlswede and N. Cai, "Arbitrarily varying multiple access channels", Part 1, *IEEE Trans. Inform. Theory*, vol. IT-45, no. 2, pp. 742–749, 1999.
- [16] R. F. Ahlswede and N. Cai, "Arbitrarily varying multiple access channels", Part 2, *IEEE Trans. Inform. Theory*, vol. IT-45, no. 2, pp. 749–756, 1999.
- [17] A. Das and P. Narayan, "Capacities of time-varying multiple-access channels with side information", *IEEE Transactions on Information Theory*, vol. 48, no. 1, pp. 4–25, 2002.
- [18] M. S. Pinsker, "Multi-user channels", *II Joint Swedish-Soviet Intern. workshop on Inform. Theory*, Gránna, Sweden, pp. 160-165, 1985.
- [19] I. Csiszár and J. Körner, *Information Theory. Coding Theorems for Discrete Memoryless Systems*, Budapest: Akad. Kiado, 1981.
- [20] I. Csiszár, "The method of types", *IEEE Trans. Inform. Theory*, vol. IT-44, pp. 2505-2523, 1998.

Փոփոխվող պարամետրով բազմամուտք կապուղու E-ունակության տիրույթի գնահատականները

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Ամփոփում

Աշխատանքում հետազոտված է փոփոխվող պարամետրով ընդհատ առանց հիշողության բազմամուտք կապուղին: Ուսումնասիրված են տարբեր դեպքեր, երբ կապուղու վիճակը հայտնի է կամ անհայտ կողավորիչին և ապակողավորիչին: Ստացված են որոշակի գնահատականներ E-ունակության և ունակության համար, միջին սխալի հավանականության դեպքում: