Title: Discrete Channel Capacity

Author: Jan Butora

Department: Department of Algebra

Supervisor: doc. Mgr. Štěpán Holub, Ph.D. et Ph.D., Department of Algebra

Abstract: This Bachelor thesis introduces and examines C.E. Shannon's discrete channel capacity theory, which was first published in 1948 as one of the founding studies in the field of mathematical information theory. In the first place, possible way of information measurement is presented and communication systems are described. Additionally, emphasis is given to discrete noiseless channel and the theorem on calculating the capacity of such channels is examined and proven. Shannon's proof is examined in detail as it contains several non-trivial results in finite differences. Finally, calculation of channel capacity using the theorem is shown in practice.

Keywords: difference equations, generating function, channel capacity