

The iCORE Lectures
Alberta Informatics Circle of Research Excellence (iCORE)

On the Theory of Turbo Coding

Presented By: **Dr Kamil Zigangirov**
iCORE Visiting Professor
Notre Dame University, US/Lund University, Sweden

Wednesday, October 15, 4 pm

Host location: Biosciences 587, University of Calgary

Interactive videolinked locations

Lethbridge: **PE256, University of Lethbridge**

Edmonton: Telus Centre Auditorium, University of Alberta

Biography

Kamil Zigangirov was born in the USSR in 1938. He received a MSc degree in 1962 from the Moscow Physico-Technical Institute and a PhD in 1966 from the Institute of Radio Engineering and electronics at the USSR Academy of Sciences, Moscow.

From 1965 to 1991, he held various research positions at the Institute for Problems of Information Transmissions at the USSR Academy of Sciences, first as a Junior Scientists, and later as a Main Scientist. During this period, he visited several universities in the United States, Sweden, Italy and Switzerland as a guest researcher and visiting professor. He organized several symposia on information theory in the USSR. In 1994, he received the Chair of telecommunications Theory at Lund University in Sweden. Since 2003, he has been a Visiting Professor in the electrical engineering department at the University of Notre Dame in the US. His scientific interests include information theory, coding theory, detection theory, and mathematical statistics. In addition to papers in these areas, he has published in 1974 a book on sequential decoding of convolutional codes (in Russian). With R. Johannesson he coauthored the textbook Fundamental of Convolutional Coding (Piscataway, NJ: IEEE Press, 1999). His book Theory of CDMA Communication will be published by IEEE Press in 2004. He is a Fellow of the IEEE.

Abstract

Low-density parity-check (LDPC) block codes were first invented in 1962. In spite of the great potential of these codes, the information-theoretical community and industry did not pay much attention to them. The situation was changed in the 1990s when turbo codes, which can be considered as an advanced version of the LDPC codes, were introduced. Then the interest in LDPC codes increased dramatically.

LDPC convolutional codes were invented by Jimenez and Zigangirov in 1999. We will define these codes, explain how they work, and demonstrate some advantages of them in comparison with LDPC block codes. Some recent extensions of LDPC codes, such as braided codes, will be discussed.