TEXAS STATE UNIVERSITY

The rising STAR *of Texas*

Discrete Mathematics Seminar

Time: Friday, 26 February 2016, 2:15-3:15 PM
Room: 237 Derrick Hall
Title: Dynamic Unbounded Integer Compression
Speaker: Dr. Dan Tamir, Department of Computer Science, Texas State University

Abstract:

Integer compression is essential in numerous systems including communication, multi-media, and information retrieval systems. In this paper we provide the details of a new approach for lossless integer compression that can be used to extend and improve several existing dynamic lossless data compression methods. The new methodology uses the Elias Delta code as the representation of the infinite alphabet of unbounded integers and utilizes this representation to enable the application of dynamic compression algorithms such as dynamic Huffman coding, dynamic dictionary compression and arithmetic coding to integer compression. We prove that the proposed dynamic coding schemas of integers are universal. The extension of the dynamic dictionary techniques and the extension of the arithmetic coding are of special interest since they can be used for block compression, and block compression is highly desirable for information retrieval. Initial, promising, results; using dynamic Huffman coding and Elias Delta coding are presented.