Claude Shannon Institute Seminar

Speaker: Professor G. David Forney, Jr. (from MIT)

Time: Wednesday, September 12th, 4:00PM

Venue: CASL Seminar Room, UCD

Title: Codes on Graphs: Past, Present and Future

Abstract: The subject of codes on graphs began with convolutional codes and trellis diagrams, and continued with tail-biting trellis realizations and low-density parity-check (LDPC) codes on Tanner graphs. In the past decade, the beginnings of a general theory of graphical realizations of linear and group codes has been developed. Cycle-free graph realizations are special, and are well understood. Trellis realizations are also quite special, and are fairly well understood, even in the cyclic (tail-biting) case. We have some powerful general duality theorems, which have nice theoretical and practical applications. Recently, some progress has been made in establishing conditions under which general graphical realizations may be ``locally reduced,'' using extensions of linear-system-theoretic concepts such as observability and controllability. However, the theory of general graphical realizations remains wide open.

Bio: G. David Forney, Jr. is an electrical engineer who has made major contributions in telecommunication system theory. He has received several major international prizes in the field, including the Edison Medal and the Claude E. Shannon Award, and is a member of the US National Academy of Sciences.