Departamento de Matemáticas

σ-Quasicyclic Convolutional Codes

Convolutional codes are usually defined as submodules of $F_q[z]^n$, where F_q is a given finite field. It is easy to see convolutional codes as direct summands of $F_q[z]^n$, by using linear algebra and properties of modules. According to this notation, σ-Quasicyclic and Projective convolutional codes are defined. These new classes of convolutional codes extend the notion of quasicyclic block codes to the convolutional case. These codes have a strong algebraic structure, as they turn to be kernels of idempotent endomorphisms on free modules over $R^l = A[z; \sigma]^l$, where A is a finite algebra over F_q and σ is an authomorphism of A, fixing F_q. In general, it is not immediate to find the free distance of a convolutional code, but the structural properties of the endomorphism can be exploited in order to define cyclic column distances for projective convolutional codes and to compute their free distance.

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Lugar: Aula 5 de la Facultad de Ciencias II (planta baja).

Biography: Gianira N. Alfarano got her Bachelor degree in Mathematics with honors at the Università del Salento (Italy) and she graduated with honors in the Master of Mathematics, curriculum of Cryptography and Coding Theory at the University of Trento (Italy). She spent four months as an intern in the Horst Görtz Institute for IT Security of Bochum (Germany), working in the group of Symmetric Cryptography, under the supervision of Professor Gregor Leander. At the moment, she is a PhD student in Applied Algebra, under the supervision of Professor Joachim Rosenthal at the University of Zurich, in Switzerland.