

UNIVERSITY OF DELAWARE  
DEPARTMENT OF MATHEMATICAL SCIENCES  
DISCRETE MATHEMATICS SEMINAR

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# Some New Results on Pseudo-random Arrays

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Arrays whose two-dimensional auto-correlation functions having desirable correlation properties have found applications in spectrometry, acoustics and cryptography for encrypting two-dimensional arrays such as images. As pointed out by I.M.Chakravarti, Gates and Azais, such arrays are applicable in the design of experiments where a plant competes with neighbors of the same type and a second type. This talk will deal with some new constructions of such arrays. We shall call them: perfect arrays. Several new families of these have been constructed by the speaker (joint work with Warwick de Launey in the quaternary case, with John Dillon and Kevin Player in the binary/ternary case). There are certain variations of these in the literature. We shall give a brief overview of this subject matter. The exciting news is our settling a few recent conjectures of Lin and Gong on perfect ternary sequences. Proof techniques were motivated by a recent seminal paper by Evans, Krattenthaler, Hollmann and Xiang.