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Dawn C. Nelson* (dnelson1@saintpeters.edu), Department of Mathematics, 2641 John F Kennedy Blvd, Jersey City, NJ 07306, and **M. Catral, P. Ford, P. Harris** and **S. J. Miller**. *The Fibonacci Quilt Sequence: A Generalization of Zeckendorf Decompositions with Non-Uniqueness.*

Zeckendorf's Theorem describes the Fibonacci sequence as the unique sequence from which every natural number can be expressed uniquely as a sum of nonconsecutive terms in the sequence. This can be viewed as a 1-dimensional process. The discovery of the Fibonacci Quilt sequence was motivated by a desire to create an analogous 2-dimensional process.

In this talk, we investigate some of the strange phenomena occurring among legal decompositions arising from the Fibonacci Quilt sequence. The decompositions are not unique and in fact the number of legal decompositions grows exponentially with the number being decomposed. The greedy algorithm only returns a legal decomposition (approximately) 93% of the time. So in its place we describe a variation on the greedy algorithm that always returns a legal decomposition and moreover returns a legal decomposition with the minimal number of summands. As time allows we will mention some of the new questions that can be asked when legal decompositions are not unique. (Received September 21, 2015)