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Prime Gradient Noise

Perlin noise is a technique for generating a smooth, random function from n-dimensional Euclidean space to the real numbers. The original algorithm described by Ken Perlin uses a small fixed table of vectors and a small predefined permutation table to generate randomness. These features induce undesirable periodicity in the generated function in large samples. We propose a method of generating a stream of pseudorandom vectors on the fly to replace these constructs, allowing us to generate an aperiodic function, all at relatively minimal cost. The key to the pseudorandom vector generation subalgorithm is a result of Vinogradov on prime numbers and equidistribution.