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Proximity Inversion Functions: A Numeration Approach

We consider functions mapping non-negative integers to non-negative real numbers such that a and $a + n$ are mapped to values at least $\frac{1}{n}$ apart for all a and n. We use a novel method to construct such a function using a numeration system and combinatorics on words. We conjecture that the supremum of the generated function is optimal and pose some unsolved problems.