

PATENT AWARDED FOR NOVEL CRYPTOGRAPHIC COMPUTATIONAL FUNCTIONS

An immense solution space that confounds QC and AI

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Researcher in computational cryptography Peter Lablans has been granted U.S. [Patent 12,665,774](#) for a new class of cryptographic

computational functions that

challenges one of the most fundamental building blocks of modern cryptography: modular addition.



For more than half a century, cryptographic systems have been built from a relatively small

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*Peter Lablans, Researcher
Computational Cryptography*

collection of computational primitives, including XOR, substitution, permutation, and modular arithmetic. The newly patented technology proposes an alternative machine-level operation that introduces non-reversible diffusion directly into computation while preserving deterministic behavior and statistical balance.

The approach opens an entirely new design space for encryption, hashing, and authentication systems. Unlike conventional binary arithmetic, the patented framework operates on non-binary elements and enables

the construction of extraordinarily large families of computational transformations. At 256 states based on 8-bit bytes, the number of possible two-operand functions exceeds $10^{150,000}$ (10 to the power one hundred and fifty thousand).

In general keys, nonces and plaintext are variables in computational cryptography. Functions are treated as immutable constants. The present invention dynamically changes a function to variable, creating a polymorphic implementation.

According to Lablans, the significance is not merely a new operation, but a new computational landscape.

"Cryptography has spent decades exploring algorithms built from essentially the same computational ingredients," said Lablans. "What happens when the computational functions we rely on as immutable, themselves change? We are no longer searching for better algorithms inside a familiar universe—we are exploring an entirely different universe of computation."

The patented operation combines a reversible function with a randomized non-reversible transition function to create a deterministic nonlinear mixing computer operation. According to the patent, the resulting transformation preserves the computational architecture of existing designs while providing access to a vastly larger family of machine-level functions or implementations.

Applications include enhancements to encryption, hashing, message authentication, and future cryptographic systems designed to adapt to evolving threats from quantum computing and artificial intelligence.

Key characteristics include:

- High nonlinearity and diffusion, while maintaining statistical neutrality
- Compatibility with existing cryptographic architectures
- Vast computational diversity enabling agile implementation

"Modern cryptography implicitly assumes that mathematical expressions and computational implementations are the same thing," said Lablans. "They are not. A mathematical primitive describes what must be accomplished. A computational implementation determines how it is accomplished. My research asks what happens when we preserve the mathematical security properties of a primitive while radically expanding the family of computational functions that can realize it."

Lablans traces this perspective to Dr. Gerrit Blaauw, co-architect of IBM's System/360. Blaauw developed the architecture/implementation/realization framework in computer design. Lablans applies a similar principle to computational functions themselves, arguing that cryptography has explored only a small fraction of the possible machine-level implementation by focusing mainly on its architecture. Thus, inadvertently foregoing an immense solution space of its fundamental primitives that is now being unlocked.

A detailed article on the patented transformation with easy to follow numerical examples may be downloaded from <https://doi.org/10.31224/3649>.

About Peter Lablans

Peter Lablans specializes in computational logic, cryptographic primitives, and computer architecture. His research focuses on logic implementations by novel function transformations in

machine cryptography.

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