CORRIGENDUM

CORRIGENDUM TO: ON GAUSSIAN FUZZY LUCAS NUMBERS

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Abstract. *The author corrects several inconsistencies in the published paper [1]. In particular, the definition range of n is revised in the relevant definitions and formulas to avoid undefined values of the Gaussian fuzzy Lucas numbers. Accordingly, the summation formula is corrected, and the generating function is removed. In addition, the parameter domain in the scalar multiplication operation is corrected. The author apologizes for any inconvenience caused to the readers.*

Keywords: *Fuzzy numbers; Gaussian numbers; Lucas numbers.*
Mathematics Subject Classification: *03E72; 11B37; 11B39.*

The following corrections should be made throughout the paper [1]:

- In Definition 1, expression (5), on page 786, is not well-defined for $n = 0$. Therefore, for mathematical consistency, Definition 1 and the recurrence relation in (6), on page 786, should be revised as follows:

Definition 1. Let $\alpha \in [0,1]$. For $n \geq 1$, the Gaussian fuzzy Lucas numbers are defined by

$$GL_n{}^{\alpha} = L_n{}^{\alpha} + iL_{n-1}{}^{\alpha}, \tag{5*}$$

where $L_n{}^{\alpha}$ is the *n*-th fuzzy Lucas number.

From (5*), it is evident that

$$GL_n{}^{\alpha} = GL_{n-1}{}^{\alpha} + GL_{n-2}{}^{\alpha}, n \geq 3, \tag{6*}$$

which is the recurrence relation for the Gaussian fuzzy Lucas numbers.

- Accordingly, the admissible index ranges in the subsequent results should be revised as follows:

    1. Proposition 1, on page 786, should be considered for $n \geq 1$.

    2. In Theorem 1, on page 786,

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part (i) should be considered for $n \geq 1$,
part (ii) should be considered for $n \geq 2$,
part (iii) should be considered for $n \geq 2$.

3. Theorem 2, on page 787, should be considered for $n \geq 1$.
4. In Theorem 5, on page 788, integers n, m, and r should be revised as $n \geq 1$ and $m, r \geq 0$.
5. Corollary 1, on page 789, should be considered for $n, r \geq 0$ with $n \geq r + 1$.
6. Corollary 2, on page 789, should be considered for $n \geq 2$.
7. Corollary 3, on page 789, should be considered for $n, p \geq 1$.

- Lemma 1 and Theorem 4, on page 788, should be revised as follows:

Lemma 1. For $n \geq 1$, let ${L_n}^\alpha$ be the n-th fuzzy Lucas number. Then

$$\sum_{m=1}^{n} {L_m}^\alpha = {L_{n+2}}^\alpha - {L_2}^\alpha. \tag{12*}$$

Proof: Since ${L_{m+2}}^\alpha = {L_{m+1}}^\alpha + {L_m}^\alpha$, we can write ${L_m}^\alpha = {L_{m+2}}^\alpha - {L_{m+1}}^\alpha$.
From a telescoping sum, the desired result can be obtained.

Theorem 4. For $n \geq 1$, the summation formula of the Gaussian fuzzy Lucas numbers is

$$\sum_{m=1}^{n} {GL_m}^\alpha = {GL_{n+2}}^\alpha - {GL_2}^\alpha.$$

Proof: By virtue of (5*) and (12*), we get

$$\sum_{m=1}^{n} {GL_m}^\alpha = \sum_{m=1}^{n} ({L_m}^\alpha + i{L_{m-1}}^\alpha)$$

$$= \sum_{m=1}^{n} {L_m}^\alpha + i \sum_{m=1}^{n} {L_{m-1}}^\alpha$$

$$= ({L_{n+2}}^\alpha - {L_2}^\alpha) + i({L_{n+1}}^\alpha - {L_1}^\alpha)$$

$$= ({L_{n+2}}^\alpha + i{L_{n+1}}^\alpha) - ({L_2}^\alpha + i{L_1}^\alpha)$$

$$= {GL_{n+2}}^\alpha - {GL_2}^\alpha.$$

- Theorem 3, on page 787, is not valid in its presented form, and it should be removed, because the proposed generating function depends on the undefined negative-index fuzzy Lucas numbers.

- Accordingly, the Abstract and Conclusions sections should be revised, respectively, as follows:

Abstract. *In the present paper, we introduce a new class of fuzzy numbers, which we will call Gaussian fuzzy Lucas numbers. We establish some fundamental properties and identities for these newly defined numbers, including the recurrence relation, Binet's formula, summation formula, and Vajda's identity, as special cases, Catalan's identity, Cassini's identity, and d'Ocagne's identity. We also establish some relationships between the Gaussian fuzzy Fibonacci and Gaussian fuzzy Lucas numbers, by virtue of the fuzzy Fibonacci and fuzzy Lucas numbers.*

CONCLUSIONS

In this paper, combining the Gaussian Lucas numbers and fuzzy numbers, the Gaussian fuzzy Lucas numbers are defined and studied. The Binet's formula and summation formula of these numbers are presented. Moreover, using the Binet's formula and Vajda's identity, as special cases, Catalan's identity, Cassini's identity and d'Ocagne's identity involving these numbers are derived.

- The parameter domain for k was incompletely stated in the Main Results section, on page 786, particularly in the scalar multiplication definition for Gaussian fuzzy Lucas numbers. The condition $k \in \mathbb{R}$ should be replaced by $k \in \mathbb{R}^+$ in the scalar multiplication operation to ensure consistency with interval arithmetic.

REFERENCE

[1] Yağmur, T., On Gaussian Fuzzy Lucas Numbers, *Journal of Science and Arts*, **25**, 783, 2025. https://doi.org/10.46939/J.Sci.Arts-25.4-a10