

# On Constructive Inverse Semigroups with Apartness: Main Results

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It is only recently, due to the work of M. Mitrović and co-authors, that constructive mathematics has paid attention to semigroup theory. The use of intuitionistic logic in constructive mathematics facilitates the extraction of computational content from constructive proofs, something almost impossible within classical mathematics. M. Mitrović and co-authors's approach to constructivism closely follows the paradigm of E. Bishop, whose informal system **BISH**, is developed in his seminal book *Foundations of Constructive Analysis* published in 1967, [1].

One of the main topics in constructive algebra are constructive algebraic structures with the relation of (tight) apartness, the second most important relation in constructive mathematics. Inspired by results obtained from the use of interactive theorem-provers and the general theory of formal verification of constructive proofs, a new constructive algebraic theory, the so-called theory of semigroups with apartness was developed by M. Mitrović and co-authors: M. N. Hounkonnou, M. A. Baroni, S. Crvenković, E. Darpö, D. A. Romano, S. Silvestrov (more on that can be found in the work of M. Mitrović, M. N. Hounkonnou and M. A. Baroni, [3]). A. Cherubini and A. Frigeri in 2019 made important steps forward introducing constructive inverse semigroups with apartness, [2]. M. Mitrović, M. N. Hounkonnou and D. A. Romano contributed to the area too, [4].

In this talk, we will first briefly present some of the results obtained within the class of constructive semigroups with apartness. Then we will present some of the main results on its proper subclass of constructive inverse semigroups with apartness given in [4].

## References

- [1] Bishop, E. (1967). *Foundations of Constructive Analysis*, McGraw-Hill, New York.
- [2] Cherubini, A. & Frigeri, A. (2019). Inverse semigroups with apartness. *Semigroup Forum* 98, 571–588.

- [3] Mitrović, M., Hounkonnou, M. N., & Baroni, M. A. (2021). Theory of constructive semi-groups with apartness - foundations, development and practice. *Fundamenta Informaticae* 184(3), 233-271.
- [4] Mitrović, M., Hounkonnou, M. N., & Romano, D. A. (2024) *A journey through constructive inverse semigroups with apartness*. Accepted for printing in Mitrović, M., & Hounkonnou, M. N. (Eds.) *Algebra without borders - Classical and Constructive Semigroups and Applications*, Springer.