革新的コンピューティング技術の開拓
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年次報告書

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Society 5.0 向け超低消費電力ブロックチェーンアクセラレータの開発

§1. 研究成果の概要

This research year has developed and evaluated performance of three hardware accelerator named Multimode SHA-2, Multi ROMix Scrypt, and Multicore BCA. These accelerators are for accelerating the different cryptography hash functions required for securing the decentralized blockchain networks. The research results have been published in three international transaction (IEEE TCAS-I: 1 paper [1], IEEE Access: 2 papers [2-3]). In addition, we have proposed new idea for detecting and avoiding counterfeit products in supply chain network. The idea has been applied for Japan patent [4] .

1. H. L. Pham, **T. H. Tran***, V. T. Duong Le and Y. Nakashima, "A High-Efficiency FPGA-Based Multimode SHA-2 Accelerator," in IEEE Access, vol. 10, pp. 11830-11845, 2022, doi: 10.1109/ACCESS.2022.3146148. (rank: Q1, IF = 3.75) Link
2. V. T. Duong Le, **T. H. Tran***, H. L. Pham, D. K. Lam and Y. Nakashima, "MRSA: A High-Efficiency Multi ROMix Scrypt Accelerator for Cryptocurrency Mining and Data Security," in IEEE Access, vol. 9, pp. 168383-168396, 2021, doi: 10.1109/ACCESS.2021.3131558. (rank: Q1, IF = 3.75) Link
3. **T. H. Tran***, H. L. Pham, T. D. Phan and Y. Nakashima, "BCA: A 530-mW Multicore Blockchain Accelerator for Power-Constrained Devices in Securing Decentralized Networks," in IEEE Transactions on Circuits and Systems I: Regular Papers, vol. 68, no. 10, pp. 4245-4258, Oct. 2021, doi: 10.1109/TCSI.2021.3102618
4. 特願 2022-058678 (出願日:2022 年 3 月 31 日):発明の名称「製品の同一性を検証する検証方法、検証装置、検証プログラム」、発明者:トラン ティ ホン、ファム ホアイ ルアン、レ ヴ ツーン ヅオン、出願人:公立大学法人大阪