

# Joint SIC and SCMA for NOMA-Based Uplink Transmission in 5G Systems

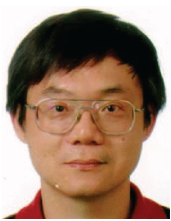
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**Abstract**—With higher access capacity, non-orthogonal multiple access (NOMA) is a promising wireless access technology to meet the demands of massive machine-type communications (mMTC) and internet of things (IoT) applications. Focused on NOMA-based uplink multiple access transmission, this paper proposes data detection schemes that integrate sparse code multiple access (SCMA) and successive interference cancellation (SIC) techniques, termed the SCMA-SIC process. Simulation comparisons of various NOMA receiver designs, including hybrid-domain NOMA and iterative detection and decoding (IDD) for coded SCMA, show that the SCMA-SIC process achieves the best system performance. In addition, with power control strategies for uplink access, the SCMA-SIC process still performs the best.

**Keyword**—sparse code multiple access (SCMA), message passing algorithm (MPA), successive interference cancellation (SIC), non-orthogonal multiple access (NOMA), uplink.



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