

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2024/0223219 A1

(43) **Pub. Date:**

Jul. 4, 2024

(54) PUNCTURING OF POLAR CODES WITH COMPLEMENTARY SEQUENCES

(71) Applicant: Telefonaktiebolaget LM Ericsson (publ), Stockholm (SE)

(72) Inventors: Dennis Hui, Sunnyvale, CA (US); Yufei Blankenship, Kildeer, IL (US)

(21) Appl. No.: 18/603,256

(22) Filed: Mar. 13, 2024

Related U.S. Application Data

(63) Continuation of application No. 17/322,573, filed on May 17, 2021, now Pat. No. 11,936,402, which is a continuation of application No. 16/497,062, filed on Sep. 24, 2019, now Pat. No. 11,012,102, filed as application No. PCT/IB2018/051935 on Mar. 22, 2018.

(60) Provisional application No. 62/476,452, filed on Mar. 24, 2017.

Publication Classification

(51) Int. Cl. H03M 13/00 H03M 13/13

(2006.01)(2006.01)

(52) U.S. Cl.

CPC H03M 13/6362 (2013.01); H03M 13/13 (2013.01)

(57)**ABSTRACT**

Systems and methods are disclosed herein for puncturing Polar-encoded bits. In some embodiments, a method of operation of a radio node that utilizes a Polar encoder comprising performing Polar encoding of a plurality of bits to provide a plurality of Polar-encoded code bits and puncturing the plurality of Polar-encoded code bits using a hybrid puncturing scheme to provide a plurality of rate-matched Polar-encoded code bits.

PERFORM POLAR ENCODING OF A SET OF BITS TO THEREBY GENERATE A SET OF POLAR-ENCODED CODE BITS 100 PUNCTURE THE POLAR-ENCODED CODE BITS USING A HYBRID PUNCTURING SCHEME THAT USES DIFFERENT PUNCTURING PATTERNS (E.G., DIFFERENT MUTUALLY COMPLEMENTARY PUNCTURING PATTERNS) FOR DIFFERENT CODE REGIONS 102 RE-ORDER THE SET OF CODED BITS 102A STORE THE RE-ORDERED SET OF CODED BITS INTO A CIRCULAR BUFFER 102B EXTRACT BITS FROM THE CIRCULAR BUFFER 102C TRANSMIT THE RATE-MATCHED POLAR-ENCODED CODE BITS

104