

CLAIMS

What is claimed is:

1. A computer-implemented method comprising:

performing, by a processor, a stochastic update for a crossbar array by generating a set of
5 stochastic pulses, the crossbar array comprising a plurality of row wires and a plurality of column
wires, the plurality of row wires comprising a first row wire and the plurality of column wires
comprising a first column wire;

wherein a three terminal device is coupled to the first row wire and the first column wire at
a crosspoint of the first row wire and the first column wire;

10 wherein a resistivity of the three terminal device is modified responsive to a coincidence of
pulses from the set of stochastic pulses at the crosspoint of the first row and the first column; and

wherein at least one terminal in the three terminal device is floating.
2. The computer-implemented method of Claim 1, wherein the three terminal device
comprises a gate terminal, a source terminal, and a drain terminal.
- 15 3. The computer-implemented method of Claim 2, wherein the gate terminal is connected to
the first row wire.
4. The computer-implemented method of Claim 3, wherein:

the source terminal is connected to the first column wire;

the plurality of row wires comprises a second row wire;

20 the drain terminal is connected to the second row wire; and

the drain terminal is floating.
5. The computer-implemented method of Claim 2, wherein the gate terminal is connected to
the first column wire.

6. The computer-implemented method of Claim 5, wherein:
- the source terminal is connected to the first row wire;
- the plurality of column wires comprises a second column wire;
- the drain terminal is connected to the second column wire; and
- 5 the drain terminal is floating.
7. The computer-implemented method of Claim 1, wherein the first three terminal device comprises a resistive processing unit.
8. A system comprising:
- a memory having computer readable instructions; and
- 10 one or more processors for executing the computer readable instructions, the computer readable instructions controlling the one or more processors to perform operations comprising:
- performing a stochastic update for a crossbar array by generating a set of stochastic pulses, the crossbar array comprising a plurality of row wires and a plurality of column wires, the plurality of row wires comprising a first row wire and the plurality of column wires comprising a
- 15 first column wire;
- wherein a three terminal device is coupled to the first row wire and the first column wire at a crosspoint of the first row wire and the first column wire;
- wherein a resistivity of the three terminal device is modified responsive to a coincidence of pulses from the set of stochastic pulses at the crosspoint of the first row and the
- 20 first column; and
- wherein at least one terminal in the three terminal device is floating.
9. The system of Claim 8, wherein the three terminal device comprises a gate terminal, a source terminal, and a drain terminal.

10. The system of Claim 9, wherein the gate terminal is connected to the first row wire.
11. The system of Claim 10, wherein:
- the source terminal is connected to the first column wire;
- the plurality of row wires comprises a second row wire;
- 5 the drain terminal is connected to the second row wire; and
- the drain terminal is floating.
12. The system of Claim 9, wherein the gate terminal is connected to the first column wire.
13. The system of Claim 12, wherein:
- the source terminal is connected to the first row wire;
- 10 the plurality of column wires comprises a second column wire;
- the drain terminal is connected to the second column wire; and
- the drain terminal is floating.
14. The system of Claim 8, wherein the first three terminal device comprises a resistive processing unit.
- 15 15. A computer program product comprising a computer readable storage medium having program instructions embodied therewith, the program instructions executable by a processor to cause the processor to perform operations comprising:
- performing, by the processor, a stochastic update for a crossbar array by generating a set of stochastic pulses, the crossbar array comprising a plurality of row wires and a plurality of column
- 20 wires, the plurality of row wires comprising a first row wire and the plurality of column wires comprising a first column wire;

wherein a three terminal device is coupled to the first row wire and the first column wire at a crosspoint of the first row wire and the first column wire; and

wherein a resistivity of the three terminal device is modified responsive to a coincidence of pulses from the set of stochastic pulses at the crosspoint of the first row and the first column; and

5 wherein at least one terminal in the three terminal device is floating.

16. The computer program product of Claim 15, wherein the three terminal device comprises a gate terminal, a source terminal, and a drain terminal.

17. The computer program product of Claim 16, wherein the gate terminal is connected to the first row wire.

10 18. The computer program product of Claim 17, wherein:

the source terminal is connected to the first column wire;

the plurality of row wires comprises a second row wire;

the drain terminal is connected to the second row wire; and

the drain terminal is floating.

15 19. The computer program product of Claim 16, wherein the gate terminal is connected to the first column wire.

20. The computer program product of Claim 19, wherein:

the source terminal is connected to the first row wire;

the plurality of column wires comprises a second column wire;

20 the drain terminal is connected to the second column wire; and

the drain terminal is floating.