WHAT IS CLAIMED IS:

1. A method for multiplexing data, the method comprising:

receiving a first binary or M-ary data associated with a first multiplexed layer (510);

encoding the first binary or M-ary data by selecting a first codeword from a first modulation codebook, wherein the first modulation codebook is assigned exclusively to the first multiplexed layer (520), and wherein the first codeword represents a modulated vector of the first binary or M-ary data over a plurality of shared resources of a network;

multiplexing the first codeword with at least a second codeword from a second modulation codebook to obtain multiplexed codewords (540), wherein the second modulation codebook is assigned exclusively to a second multiplexed layer (530); and

transmitting the multiplexed codewords over the shared resources of ~~a~~ the network (550).

2. The method of claim 1, wherein encoding the first binary or M-ary data by selecting the first codeword comprises:

selecting the first codeword from a first set of codewords in the first modulation codebook in accordance with a binary or M-ary value of the first binary or M-ary data, wherein each codeword in the first set of codewords is associated with a different binary or M-ary value.

3. The method of claim 2, wherein each codeword in the first set of codewords comprises a low density of non-zero values such that the corresponding codeword can be detected within multiplexed codewords in accordance with a message passing algorithm (MPA).

4. The method of claim 1, wherein the first multiplexed layer is associated with a first user and the second multiplexed layer is associated with a second user.

~~5. The method of claim 1, wherein the first multiplexed layer and the second multiplexed layer carry separate data streams associated with a common.~~

6.5. The method of claim 51, wherein the first multiplexed layer and the second multiplexed layer occupy different multiple-input-multiple-output (MIMO) spatial layers.

7.6. The method of claim 51, wherein the first multiplexed layer and the second multiplexed layer occupy different Orthogonal Frequency-Division Multiple Access (OFDMA) tones.

8.7. A transmitter comprising:

a processor; and

a computer readable storage medium storing programming for execution by the processor, the programming including instructions to:

receive a first binary or M-ary data associated with a first multiplexed layer;

encode the first binary or M-ary data by selecting a first codeword (414) from a first modulation codebook (410), wherein the first modulation codebook is assigned exclusively to the first multiplexed layer, and wherein the first codeword represents a modulated vector of the first binary or M-ary data over a plurality of shared resources of a network;

multiplex the first codeword with at least a second codeword (421) from a second modulation codebook to obtain multiplexed codewords (480), wherein the second modulation codebook is assigned exclusively to a second multiplexed layer; and

transmit the multiplexed codewords over shared resources of a network.

9.8. A method for receiving data, the method comprising:

receiving a signal carrying multiplexed codewords, the multiplexed codewords including a plurality of codewords communicated over shared resources of a network, wherein each of the plurality of codewords belongs to a different one of a plurality of modulation codebooks, wherein each of the plurality of modulation codebooks are associated with a different one of a plurality of multiplexed layers(610);

identifying, by a receiver, a first one of the plurality of codewords within the multiplexed

codewords, the first codeword belonging to a first one of the plurality of codebooks assigned exclusively to a first one of the plurality of multiplexed layers, wherein the receiver is associated with the first multiplexed layer (620), and wherein the first codeword represents a modulated vector of a first binary or M-ary data over a plurality of shared resources of a network; and

decoding the first codeword to obtain a first binary or M-ary data(630).

~~10.~~9. The method of claim ~~9~~8, wherein identifying the first codeword within the multiplexed codewords comprises applying a message passing algorithm (MPA) to detect the first codeword amongst the plurality of codewords included within the multiplexed codewords.

~~11.~~10. The method of claim ~~10~~9, wherein decoding the first codeword to obtain the first binary or M-ary data comprises:

mapping the first codeword directly to a binary or M-ary value of the first binary or M-ary data, wherein each codeword in the first modulation codebook is associated with a different binary or M-ary value.

~~12.~~11. The method of claim ~~10~~9, wherein different ones of the plurality of multiplexed layers occupy different multiple-input-multiple-output (MIMO) spatial layers.

~~13.~~12. The method of claim ~~9~~8, wherein different ones of the plurality of multiplexed layers occupy different Orthogonal Frequency-Division Multiple Access (OFDMA) tones.

~~14.~~13. A receiver comprising:

a processor; and

a computer readable storage medium storing programming for execution by the processor, the programming including instructions to:

receive a signal carrying multiplexed codewords, the multiplexed codewords including a plurality of codewords communicated over shared resources of a network,

wherein each of the plurality of codewords belongs to a different one of a plurality of modulation codebooks, wherein each of the plurality of modulation codebooks are associated with a different one of a plurality of multiplexed layers;

identify a first one of the plurality of codewords within the multiplexed codewords, the first codeword belonging to a first one of the plurality of codebooks assigned exclusively to a first one of the plurality of multiplexed layers, wherein the receiver is associated with the first multiplexed layer(620), and wherein the first codeword represents a modulated vector of a first binary or M-ary data over a plurality of shared resources of a network; and

decode the first codeword to obtain a first binary or M-ary data (630).