

WHAT IS CLAIMED IS:

1. ~~— A method of wireless communication performed by a user equipment (UE) for uplink transmission in a slot, comprising:~~

~~mapping channel state information (CSI) to first resource elements that are distributed in frequency, wherein the first resource elements are in a set of resources allocated on an uplink shared channel;~~

~~mapping hybrid automatic repeat request (HARQ) feedback to second resource elements that are distributed in frequency, wherein the second resource elements are in the set of resources;~~

~~wherein the second resource elements are reserved for the HARQ feedback and are different from the first resource elements; and
transmitting the CSI and the HARQ feedback on the uplink shared channel in accordance with the mappings.~~

2. ~~— The method of claim 1, wherein one or more resource elements comprising a phase tracking reference signal are excluded from the first resource elements.~~

3. ~~— The method of claim 1, wherein the first resource elements and the second resource elements are distributed in frequency based at least in part on respective step sizes, wherein the respective step sizes are based at least in part on respective amounts of the CSI and the HARQ feedback.~~

4. ~~— The method of claim 1, wherein mapping the CSI and mapping the HARQ feedback are performed in a frequency-first, time-second manner.~~

5. ~~— The method of claim 1, wherein the first resource elements and the second resource elements are orthogonal such that the HARQ feedback does not puncture the CSI.~~

6. ~~— The method of claim 1, wherein the second resource elements follow a demodulation reference signal (DMRS) in the slot.~~

7. ~~— The method of claim 1, wherein the HARQ feedback punctures data symbols of the uplink shared channel.~~

8. — The method of claim 1, wherein rate matching is used for the CSI and the HARQ feedback.

9. — A user equipment (UE) for wireless communication, comprising:
a memory; and
one or more processors coupled to the memory, the memory and the one or more processors configured to:

map channel state information (CSI) to first resource elements that are distributed in frequency, wherein the first resource elements are in a set of resources allocated on an uplink shared channel;

map hybrid automatic repeat request (HARQ) feedback to second resource elements that are distributed in frequency, wherein the second resource elements are in the set of resources;

wherein the second resource elements are reserved for the HARQ feedback and are different from the first resource elements; and
transmit the CSI and the HARQ feedback on the uplink shared channel in accordance with the mappings.

10. — The UE of claim 9, wherein one or more resource elements comprising a phase-tracking reference signal are excluded from the first resource elements.

11. — The UE of claim 9, wherein the first resource elements and the second resource elements are distributed in frequency based at least in part on respective step sizes, wherein the respective step sizes are based at least in part on respective amounts of the CSI and the HARQ feedback.

12. — The UE of claim 9, wherein mapping the CSI and mapping the HARQ feedback are performed in a frequency first, time second manner.

13. — The UE of claim 9, wherein the first resource elements and the second resource elements are orthogonal such that the HARQ feedback does not puncture the CSI.

14. — The UE of claim 9, wherein the second resource elements are mapped after a reference signal of the uplink shared channel.

15. — The UE of claim 9, wherein the HARQ feedback punctures data symbols of the uplink shared channel.

16. — The UE of claim 9, wherein rate matching is used for the CSI and the HARQ feedback.

17. — A user equipment (UE) for wireless communication, comprising:

- an encoder component to encode uplink control information (UCI) and an uplink shared channel to generate an encoded communication, wherein the UCI includes at least one of channel state information (CSI) or hybrid automatic repeat request (HARQ) feedback;

- a modulator component to modulate the encoded communication onto a carrier signal;

- a UCI mapper component to map the UCI to resource elements of the uplink shared channel,

- wherein the CSI is mapped to first resource elements of the resource elements,

- wherein the HARQ feedback is mapped to second resource elements of the resource elements,

- wherein the second resource elements are reserved for the HARQ feedback and are different from the first resource elements;

- a discrete Fourier transform (DFT) component to perform DFT spreading of the uplink shared channel;

- a sub-band mapping component to map an output of the DFT spreading to sub-bands of an output signal;

- an inverse fast Fourier transform (IFFT) component to perform an IFFT on the output signal; and

- a transmitter component to transmit the output signal.

18. — The UE of claim 17, wherein the second resource elements are mapped after a reference signal of the uplink shared channel.

19. — The UE of claim 17, wherein the first resource elements are distributed in frequency.

20. — The UE of claim 17, wherein the HARQ feedback punctures data symbols of the uplink shared channel.

21. — The UE of claim 17, wherein rate matching is used for the CSI and the HARQ feedback.

22. — The UE of claim 17, wherein one or more resource elements comprising a phase tracking reference signal are excluded from the first resource elements.

23. — The UE of claim 17, wherein the first resource elements and the second resource elements are distributed in frequency based at least in part on respective step sizes; wherein the respective step sizes are based at least in part on respective amounts of the CSI and the HARQ feedback.

24. — The UE of claim 17, wherein mapping the CSI and mapping the HARQ feedback are performed in a frequency first, time second manner.

25. — The UE of claim 17, wherein the first resource elements and the second resource elements are orthogonal such that the HARQ feedback does not puncture the CSI.

26. — An apparatus for wireless communication, comprising:

means for mapping channel state information (CSI) to first resource elements that are distributed in frequency, wherein the first resource elements are in a set of resources allocated on an uplink shared channel;

means for mapping hybrid automatic repeat request (HARQ) feedback to second resource elements that are distributed in frequency, wherein the second resource elements are in the set of resources;

~~wherein the second resource elements are reserved for the HARQ feedback and are different from the first resource elements; and means for transmitting the CSI and the HARQ feedback on the uplink shared channel in accordance with the mappings.~~

~~27.— The apparatus of claim 26, wherein one or more resource elements comprising a phase-tracking reference signal are excluded from the first resource elements.~~

~~28.— The apparatus of claim 26, wherein the first resource elements and the second resource elements are distributed in frequency based at least in part on respective step sizes, wherein the respective step sizes are based at least in part on respective amounts of the CSI and the HARQ feedback.~~

~~29.— The apparatus of claim 26, wherein mapping the CSI and mapping the HARQ feedback are performed in a frequency first, time second manner.~~

~~30.— The apparatus of claim 26, wherein the first resource elements and the second resource elements are orthogonal such that the HARQ feedback does not puncture the CSI.~~

~~31.— The apparatus of claim 26, wherein the second resource elements are mapped after a reference signal of the uplink shared channel.~~

~~32.— The apparatus of claim 26, wherein the HARQ feedback puncture data symbols of the uplink shared channel.~~

~~33.— The apparatus of claim 26, wherein rate matching is used for the CSI and the HARQ feedback.~~

~~34.— A non-transitory computer-readable medium storing one or more instructions for wireless communication, the one or more instructions comprising:~~

~~one or more instructions that, when executed by one or more processors of a user equipment, cause the user equipment to:~~

~~map channel state information (CSI) to first resource elements that are distributed in frequency, wherein the first resource elements are in a set of resources allocated on an uplink shared channel;~~
~~map hybrid automatic repeat request (HARQ) feedback to second resource elements that are distributed in frequency, wherein the second resource elements are in the set of resources;~~
~~wherein the second resource elements are reserved for the HARQ feedback and are different from the first resource elements; and~~
~~transmit the CSI and the HARQ feedback on the uplink shared channel in accordance with the mappings~~

35. — ~~The non-transitory computer-readable medium of claim 34, wherein one or more resource elements comprising a phase-tracking reference signal are excluded from the first resource elements.~~

36. — ~~The non-transitory computer-readable medium of claim 34, wherein the first resource elements and the second resource elements are distributed in frequency based at least in part on respective step sizes, wherein the respective step sizes are based at least in part on respective amounts of the CSI and the HARQ feedback.~~

37. — ~~The non-transitory computer-readable medium of claim 34, wherein mapping the CSI and mapping the HARQ feedback are performed in a frequency-first, time-second manner.~~

38. — ~~The non-transitory computer-readable medium of claim 34, wherein the first resource elements and the second resource elements are orthogonal such that the HARQ feedback does not puncture the CSI.~~

39. — ~~The non-transitory computer-readable medium of claim 34, wherein the second resource elements are mapped after a reference signal of the uplink shared channel.~~

40. — ~~The non-transitory computer-readable medium of claim 34, wherein the HARQ feedback punctures data symbols of the uplink shared channel.~~

41.1. ~~The non-transitory computer-readable medium of claim 34, wherein rate matching is used for the CSI and the HARQ feedback.~~ An invention not claimed in any divisional application.