

CLAIMS

1. A method of wireless communication performed by a user equipment (UE), comprising: determining that a physical uplink shared channel (PUSCH) communication, scheduled by an uplink grant, and a physical uplink control channel (PUCCH) communication, corresponding to a physical downlink shared channel (PDSCH) communication scheduled by a downlink grant, are scheduled to overlap in one or more symbols, wherein the PUCCH communication includes uplink control information (UCI); determining a threshold time based at least in part on an earliest scheduled starting time of the PUSCH communication or the PUCCH communication; determining whether the uplink grant, the downlink grant, and a last symbol of the PDSCH communication are received before the threshold time; and transmitting the PUSCH communication, with the UCI multiplexed on the PUSCH communication by the UE, based at least on determining that the uplink grant, the downlink grant, and the last symbol of the PDSCH communication are received before the threshold time.
2. The method of claim 1, wherein the UCI and PUSCH communication are multiplexed by: piggybacking the UCI of the PUCCH communication in the PUSCH communication, puncturing the PUSCH communication, or rate-matching the PUSCH communication around the UCI.
3. The method of claim 1, wherein the PUSCH communication and the PUCCH communication are scheduled to start in different symbols, and wherein the earliest scheduled starting time is determined based at least in part on whichever of the PUSCH communication or the PUCCH communication is scheduled to start in an earlier symbol.
4. The method of claim 1, wherein the PUSCH communication and the PUCCH communication are included in a same PUCCH group.
5. The method of claim 1, wherein determining whether the uplink grant, the downlink grant, and the last symbol of the PDSCH communication are received before the threshold time comprises: determining that at least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the threshold time; and wherein the method further comprises: transmitting the PUSCH communication, the PUCCH communication, or neither the PUSCH communication nor the PUCCH communication based at least in part on determining that the at least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the threshold time.
6. The method of claim 1, further comprising dropping both the PUSCH communication and the PUCCH communication based at least in part on determining that at least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the threshold time.
7. The method of claim 1, further comprising transmitting one of and dropping the other of the PUCCH communication or the PUSCH communication based at least in part on determining that at least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the threshold time.
8. The method of claim 1, further comprising transmitting one of and dropping the other of the following based at least in part on determining that at least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the

threshold time: whichever one of the PUCCH communication or the PUSCH communication that is scheduled to start in an earlier symbol, or whichever one of the PUCCH communication or the PUSCH communication that is scheduled to start in a later symbol.

9. The method of claim 1, wherein the UCI includes acknowledgment or negative acknowledgement (ACK/NACK) feedback associated with the PDSCH communication.

10. An apparatus for wireless communication, comprising: a processor; memory coupled with the processor; and instructions stored in the memory and executable by the processor to cause the apparatus to: determine that a physical uplink shared channel (PUSCH) communication, scheduled by an uplink grant, and a physical uplink control channel (PUCCH) communication, corresponding to a physical downlink shared channel (PDSCH) communication scheduled by a downlink grant, are scheduled to overlap in one or more symbols, wherein the PUCCH communication includes uplink control information (UCI); determine a threshold time based at least in part on an earliest scheduled starting time of the PUSCH communication or the PUCCH communication; determine whether the uplink grant, the downlink grant, and a last symbol of the PDSCH communication are received before the threshold time; and transmit the PUSCH communication, with the UCI multiplexed on the PUSCH communication by the apparatus, based at least on determining that the uplink grant, the downlink grant, and the last symbol of the PDSCH communication are received before the threshold time.

11. The apparatus of claim 10, wherein the UCI and PUSCH communication are multiplexed by: piggybacking the UCI of the PUCCH communication in the PUSCH communication, puncturing the PUSCH communication, or rate-matching the PUSCH communication around the UCI.

12. The apparatus of claim 10, wherein the PUSCH communication and the PUCCH communication are scheduled to start in different symbols, and wherein the earliest scheduled starting time is determined based at least in part on whichever of the PUSCH communication or the PUCCH communication is scheduled to start in an earlier symbol.

13. The apparatus of claim 10, wherein the PUSCH communication and the PUCCH communication are included in a same PUCCH group.

14. The apparatus of claim 10, wherein the instructions to cause the apparatus to determine whether the uplink grant, the downlink grant, and the last symbol of the PDSCH communication are received before the threshold time, cause the apparatus to: determine that at least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the threshold time; and further comprising instructions to cause the apparatus to: transmit the PUSCH communication, the PUCCH communication, or neither the PUSCH communication nor the PUCCH communication based at least in part on determining that the at least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the threshold time.

15. The apparatus of claim 10, further comprising instructions operable to cause the apparatus to drop both the PUSCH communication and the PUCCH communication based at least in part on determining that at least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the threshold time.

16. The apparatus of claim 10, further comprising instructions operable to cause the apparatus to transmit one of and drop the other of the PUCCH communication or the PUSCH communication based at least in part on determining that at least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the threshold time.

17. The apparatus of claim 10, further comprising instructions operable to cause the apparatus to transmit one of and drop the other of the following based at least in part on determining that at least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the threshold time: whichever one of the PUCCH communication or the PUSCH communication that is scheduled to start in an earlier symbol, or whichever one of the PUCCH communication or the PUSCH communication that is scheduled to start in a later symbol.

18. The apparatus of claim 10, wherein the UCI includes acknowledgment or negative acknowledgement (ACK/NACK) feedback associated with the PDSCH communication.

19. An apparatus for wireless communication, comprising: means for determining that a physical uplink shared channel (PUSCH) communication, scheduled by an uplink grant, and a physical uplink control channel (PUCCH) communication, corresponding to a physical downlink shared channel (PDSCH) communication scheduled by a downlink grant, are scheduled to overlap in one or more symbols, wherein the PUCCH communication includes uplink control information (UCI); means for determining a threshold time based at least in part on an earliest scheduled starting time of the PUSCH communication or the PUCCH communication; means for determine whether the uplink grant, the downlink grant, and a last symbol of the PDSCH communication are received before the threshold time; and means for transmitting the PUSCH communication, with the UCI multiplexed on the PUSCH communication by the apparatus, based at least on determining that the uplink grant, the downlink grant, and the last symbol of the PDSCH communication are received before the threshold time.

20. The apparatus of claim 19, wherein the UCI and PUSCH communication are multiplexed by: piggybacking the UCI of the PUCCH communication in the PUSCH communication, puncturing the PUSCH communication, or rate-matching the PUSCH communication around the UCI.

21. The apparatus of claim 19, wherein the PUSCH communication and the PUCCH communication are scheduled to start in different symbols, and wherein the earliest scheduled starting time is determined based at least in part on whichever of the PUSCH communication or the PUCCH communication is scheduled to start in an earlier symbol.

22. The apparatus of claim 19, wherein the PUSCH communication and the PUCCH communication are included in a same PUCCH group.

23. The apparatus of claim 19, wherein the means for determining whether the uplink grant, the downlink grant, and the last symbol of the PDSCH communication are received before the threshold time comprises: means for determining that at least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the threshold time; and wherein the apparatus further comprises: means for transmitting the PUSCH communication, the PUCCH communication, or neither the PUSCH communication nor the PUCCH communication based at least in part on the means for determining that the at

least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the threshold time.

24. The apparatus of claim 19, further comprising means for dropping both the PUSCH communication and the PUCCH communication based at least in part on the means for determining that at least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the threshold time.

25. The apparatus of claim 19, further comprising means for transmitting one of and dropping the other of the PUCCH communication or the PUSCH communication based at least in part on the means for determining that at least one of the uplink grant, the downlink grant, or a last symbol of the PDSCH communication is received after the threshold time.

26. The apparatus of claim 19, further comprising means for transmitting one of and dropping the other of the following based at least in part on the means for determining that at least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the threshold time: whichever one of the PUCCH communication or the PUSCH communication that is scheduled to start in an earlier symbol, or whichever one of the PUCCH communication or the PUSCH communication that is scheduled to start in a later symbol.

27. The apparatus of claim 19, wherein the UCI includes acknowledgment or negative acknowledgement (ACK/NACK) feedback associated with the PDSCH communication.

28. A non-transitory computer readable storage medium that stores instructions that when executed by a user equipment (UE) causes the UE to: determine that a physical uplink shared channel (PUSCH) communication, scheduled by an uplink grant, and a physical uplink control channel (PUCCH) communication, corresponding to a physical downlink shared channel (PDSCH) communication scheduled by a downlink grant, are scheduled to overlap in one or more symbols, wherein the PUCCH communication includes uplink control information (UCI); determine a threshold time based at least in part on an earliest scheduled starting time of the PUSCH communication or the PUCCH communication; determine whether the uplink grant, the downlink grant, and a last symbol of the PDSCH communication are received before the threshold time; and transmit the PUSCH communication, with the UCI multiplexed on the PUSCH communication by the UE, based at least on determining that the uplink grant, the downlink grant, and the last symbol of the PDSCH communication are received before the threshold time.

29. The non-transitory computer readable storage medium of claim 28, wherein the UCI and PUSCH communication are multiplexed by: piggybacking the UCI of the PUCCH communication in the PUSCH communication, puncturing the PUSCH communication, or rate-matching the PUSCH communication around the UCI.

30. The non-transitory computer readable storage medium of claim 28, wherein the PUSCH communication and the PUCCH communication are scheduled to start in different symbols, and wherein the earliest scheduled starting time is determined based at least in part on whichever of the PUSCH communication or the PUCCH communication is scheduled to start in an earlier symbol.

31. The non-transitory computer readable storage medium of claim 28, wherein the instructions that cause the UE to determine whether the uplink grant, the downlink grant, and

the last symbol of the PDSCH communication are received before the threshold time, cause the UE to: determine that at least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the threshold time; and further comprising instructions that cause the UE to: transmit the PUSCH communication, the PUCCH communication, or neither the PUSCH communication nor the PUCCH communication.

32. The non-transitory computer readable storage medium of claim 28, wherein the UCI includes acknowledgment or negative acknowledgement (ACK/NACK) feedback associated with the PDSCH communication.

33. The non-transitory computer readable storage medium of claim 28, wherein the PUSCH communication and the PUCCH communication are included in a same PUCCH group.

34. The non-transitory computer readable storage medium of claim 28, wherein the instructions further cause the UE to drop the PUSCH communication and the PUCCH communication based at least in part on determining that at least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the threshold time.

35. The non-transitory computer readable storage medium of claim 28, wherein the instructions further cause the UE to drop one of and dropping the other of the PUCCH communication or the PUSCH communication based at least in part on determining that at least one of the uplink grant, the downlink grant, the a last symbol of the PDSCH communication is received after the threshold time.

36. The non-transitory computer readable storage medium of claim 28, wherein the instructions further cause the UE to drop one of and dropping the other of the following based at least in part on determining that at least one of the uplink grant, the downlink grant, or the last symbol of the PDSCH communication is received after the threshold time: whichever one of the PUCCH communication or the PUSCH communication that is scheduled to start in an earlier symbol, or whichever one of the PUCCH communication or the PUSCH communication that is scheduled to start in a later symbol.