CCE 5302 – Intelligent Wireless Solutions

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Tutorial

1. Describe a Relay Channel of 3 nodes and thus show how this can be modelled.

2. Explain how the Relay Channel capacity upper limit is determined.

3. What is the capacity lower bound of the general relay channel?

4. Explain how the effective data rate is obtained in an estimate and forward Relay Channel.

5. Describe a Cooperative Broadcast Channel and thus show how this can be modelled.

6. Explain how the capacity lower bound of a Cooperative Broadcast Channel is found.

7. What is the capacity region of the degraded Cooperative Broadcast Channel? Give the solution with and without feedback.

8. Describe the Cooperative Multiple Access Channel and thus show how this can be modelled.

9. What is the capacity region of the discrete Cooperative Multiple Access Channel? Assume that it has both conference and private links.

10. Explain why optimal coding for discrete channels cannot always be directly applied to AWGN channels.

11. What is the capacity of the non-orthogonal Gaussian Cooperative Broadcast Channel with unidirectional cooperation links?

12. What is the capacity of the orthogonal Gaussian Cooperative Broadcast Channel with unidirectional cooperation links?

13. What is the capacity of an AWGN Relay Channel?

14. Discuss the possible cooperation solutions that can be applied to wireless cellular systems and their feasibility.

15. How base station cooperation implemented and what are its limitations?

16. How can we model cooperation in cellular systems and how can the capacity be determined?

17. Describe the cellular cooperative uplink and downlink channel.

18. Considering a Relay Channel, how can this cooperation be modeled to consider power requirements?

19. Discuss user-based cooperation and coded cooperation.

20. Describe the Relay Power allocation algorithm.

21. What are the requirements in heterogeneous wireless networks?

22. Mobility management and Handover management are important tasks of the radio resource management, discuss.

23. How can congestion be avoided and controlled in heterogeneous wireless networks?

24. What is cooperative radio resource management?

25. Why is user location important in wireless networks?

26. Explain how localization is done using radio signal strength measurements.

27. Discuss the different time-of-arrival localization methods.

28. Explain the angle-of-arrival method.

29. Coarse location estimation techniques can use area measurements and hop count measurements, discuss.