ECE8863: COGNITIVE RADIO NETWORKS

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FINAL EXAM: MAY 5, 2011

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* PUT A CODEWORD NEXT TO YOUR NAME!!!
* OPEN BOOK EXAM (EVERYTHING ALLOWED EXCEPT LAPTOPS AND CELL PHONES)
* DURATION: 170 MINUTES
* ANSWER THE QUESTIONS RIGHT TO THE POINT;
* AVOID LONG EXPLANATIONS; COUPLE SENTENCES WILL BE ENOUGH AS LONG AS THEY ARE CORRECT!! GIVE SHORT ANSWERS!!!
* EACH QUESTION HAS 10 POINTS

Spectrum Mobility Questions:

Q1. Compare the pros and cons of proactive and reactive spectrum handoffs.

Q2. Explain how a link can be successfully maintained in opportunistic spectrum handoff situation. How is it different from the case in the negotiated situation?

MAC Questions:

Q3. What are the hardware constraints that can impact the performance of cognitive radio MAC protocols?

Q4. What is the stopping criterion for spectrum sensing in the HC-MAC and describe the worst-case sensing scenario under this stopping criterion?

CCC Questions:

Q5. OFDM-based CCC
Why are the orthogonality and PAPR constraints necessary in the optimization framework?

Q6. Comparison (Sequence-based CCC)
(a) List two problems in SYNC MAC and explain how they are resolved by the Sequence-based Rendezvous solution.
(b) Identify two problems in Sequence-based Rendezvous and explain how they are addressed by quorum-based CCC solutions.

Q7. Comparison (Group-based CCC)
(a) Compare the pros and cons of two group-based solutions: SOC and SI-based CCC.
(b) Identify the major problem in SI-based CCC and explain how it is resolved by ERCC?

Routing Questions:

Q8. What are the differences in the route maintenance process between traditional wireless networks and cognitive radio networks?

Q9. How can the cooperative relaying increase the performance in wireless networks?

Q10. Why OPERA protocol is spectrum-aware?