Unit 4. Checklist

General Scheme of the Digital Communication System

- Do I know what a symbol is?
- Do I have a clear understanding of all the blocks in the system representation?
- Do I understand the purpose of each block?

Signal Space

- Do I clearly understand the concepts of an orthonormal set of basis functions, signal space, constellation, and decision region?
- Do I know how to compute an orthonormal set of basis functions given a set of signals?
- How is the energy of a signal related to its vector in the signal space?

Decision Criteria

- What do the MAP and ML criteria consist of?
- What is the geometric interpretation of the ML criterion?

Error Probability Calculation

- Do I know how to calculate the exact value of the error probability in a simple, one-dimensional constellation? And can I do the same if the noise is not AWGN?
- For more complex cases, do I understand how bounds work?
- What is the difference between the union bound and the simplified union bound? When are they equal?
- What parameters can I modify in the system to reduce the probability of error?

System Implementation

- Do I clearly understand each of the detector implementations: the bank of correlators and the bank of matched filters?
- Do I clearly understand the decisor's implementation?

Have I completed the review problem?