ECE 563: Problem Set 3
Information Flow and Multiple Access

Released: Wednesday, February 28
Due: Wednesday, March 6

1. [**Data Processing Inequality**]

    (a) State and prove a version of the data processing inequality.

    (b) (Optional) State and prove a strong data processing inequality due to Evans and Schulman (1999) in a paper entitled "Signal propagation and noisy circuits".

2. [**Problem 15.3 in Cover and Thomas**]
   Cut-set interpretation of capacity region of multiple-access channel.

3. [**Problem 15.1 in Cover and Thomas**]
   Cooperative capacity of a multiple-access channel.

4. [**Critique**]
   In a paragraph or two, provide a critique of the Goddard-Xiang-Soloveychik (2023) mathematical formulation of invariant causal prediction, and if possible, provide alternatives.

5. [**Project**]
   In a paragraph or two, provide a brief proposal for the final project you aim to undertake.