EE 60671: Advanced Digital Signal Processing

Instructor: Prof. Martin Haenggi, 274 Fitzpatrick, mhaenggi@nd.edu
Lecture: TTh 03:30-04:45pm, 333 DBRT
Grading: 15% homework, 35% midterm, 50% final exam.

Tentative Course Outline

1. **Discrete-time Signals and LTI Systems** (Chapters 1–5, 7, 8; Sec. 12.1).
   Convolution and correlation; random signals; linear time-invariant systems; transforms.

2. **Sampling and Finite-precision Effects** (Chapter 6).
   AD/DA; aliasing; quantization; oversampling.

3. **Filter Design and Filter Structures** (Chapters 9, 10).
   FIR and IIR filter design; implementation.

4. **Multirate DSP** (Chapter 11).
   Interpolation and decimation; filter bank design; polyphase structures.

5. If there is time: **Optimal Filtering of Random Signals** (Chapters 12,13).
   Prediction; Wiener filters; LMS and RLS adaptive filters

Other Resources


Other Information

- The university honor code applies. You may collaborate on homework but you must hand in your own work. Consulting the textbook’s solution manual is explicitly forbidden.

- It is assumed that you have had a standard undergraduate-level course on digital signal processing, which (roughly) covers Chapters 1–5, 7, and 8 of the textbook.

- Office hours are “open”, which means that you can send me an e-mail and I will make time for you as soon as possible. It can be in-person or via zoom.