Digital Filter Design Using FDATool

25.108 Intro to Engineering II
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What is a Digital Filter

• Passes a band of frequencies and rejects other frequencies
  – Three Bands of Interest
    • Pass band, The frequencies which get through
    • Stop band, the frequencies which don’t get through
    • Transition bands, the bands in which part of the frequencies get through, between stop and pass bands
Types of Digital Filters

• Low Pass
• High Pass
• Band Pass
• Band Stop
Filter Implementations

• Infinite Impulse Response (IIR)
  – Feedback filter
• Finite Impulse response
  – Feed Forward
• Hybrid IIR/FIR
Key parameters in filter design

- Sampling rate
- Number of Taps
- Pass band
- Stop Band
- Stop Band Depth (rejection)
Using FDA Tool

- Type "FDATOOL" at command prompt
Step 2: Enter Parameters

• Enter Sampling Frequency
• Pass Band
• Stop Band
• Leave Everything else the same
Step 3: Design Filter

• Push “design Filter Button

Filter Response Shown

Number of Taps, if too many, change rejection, to say 50 or 60
Step 4: Export Coefficients

- On “File Menu” Type Export

Create “Num”, and “Den”. If you have matlab 6.5, type “Den=1”
Step 5: do the filtering

- Type

- ">> Output=filter(Num,Den,Input)" to apply the filter you have created. It is simple as that.