Course

MEC-E5001
Course materials
Your points
Lab Queue

This course has already ended.

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Lecture Quiz 5

Points 0 / 350 | My submissions 0 / 2 | Deadline Tuesday, 13 February 2024, 09:00 | To be submitted alone | Show model answer

The deadline for the assignment has passed (Tuesday, 20 February 2024, 09:00).

Question 1 116 points

How do the active noise cancelling head phones work?

- The headset has an internal mic that listens to the noise. Then the headphones generate an opposite audio wave that is identical to the noise wave signal but is out of phase, thus shutting down the noise by destructive interference.
- The headset has an internal mic that listens to the noise. Then the headphones erase the noise by not filtering the listened noise wave signal from the audio you are listening to.
- The headset has an internal mic that listens to the noise. Then the headphones use PWM to create digital signal from the analogous noise, which can then be removed from the bitstream you are listening to.
- The headset are cursed so that the wearer cannot participate to the real-world. They are completely sucked into the digital abyss of the virtual domain. The curse can only be broken by setting a mute spell to the headphone's mic.

Question 2 117 points

How can you compensate a disturbing wave signal?

- Create an opposite signal that has a higher amplitude then the disturbing signal to drown it out.
- Using PWM to create a digital version of the analogous disturbance, which you can then digitally compensate.
- Replicate the disturbing signal and make it out of phase, mirroring the disturbing signal.
- Make a signal that uses an op amp to invert the amplitude of the disturbing signal, making more than million times quieter than it originally is.

Question 3 117 points

Determine resonance frequency and roots of characteristic polynomial of position servo control $K = K_d = 2,\ J = 1$.

$H_d = \frac{K_d/J + K/J}{s^2 + K_d s/J + K/J}$

Tip: analyse denominator

- resonance frequency 1.414, roots -1+j and -1-j
- resonance frequency 2, roots 4j and -4j
- resonance frequency 1/2, roots 1+j and 1-j
- resonance frequency 1.414, roots 2+j and 2-j

Submit

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