HKUSTx: ELEC1200.3x A System View of Communications: From Signals to Packets (Part 3)

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Lab 1 Task 4 theoretical efficiency from lecture equation

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discussion posted about 18 hours ago by KarenWest

I have everything calculated correctly in Lab 1 Task 4 except for the theoretical efficiency from the lecture equation. Here is a code snip of only that section. Does anyone know what's wrong with my equation? Thanks.

```
p = p_list(pc);
if (p ~= 0) && (p~= 1) && (n_coll(pc) >= 1)
     exponentValue = n_coll(pc) - 1;
     exponentPart = (1 - p)^exponentValue;
     expeff_v(pc) = n_coll(pc) * p * exponentPart;
elseif (p == 0)
     expeff_v(pc) = 1;
elseif (p == 1)
     expeff_v(pc) = 0;
end
```

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3 responses

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Elaktrona

about 14 hours ago

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N in the above expressions for computing expeff_v should be **n_users**, not n_coll(pc)

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PeterB001

about 14 hours ago

1 Vote

Hi Karen,

Have a look at slide #5 of "ELEC1200_3x_Wk1_T2_L4_Efficiency_of_Slotted_Aloha.pdf". You can implement this in one line of code if you use the Element-wise operator (".").

In that formula what is "N"? - "N" is a constant.

Good luck

Add a comment

KarenWest

about 8 hours ago

0 Votes

Thank you both for your responses and I will investigate my mistakes and your comments later today and post back here. I'm on snow clean up duty this morning! Easton (south of Boston,MA) only got about 8 inches, so nothing to clean up compared to NY City, Philadelphia and the Washington DC area. So I'll be back later! Thanks for your help.

I appreciate your comments that N is a constant, but I find I'm still confused with the formula, since I thought that N was the number of collisions for a given probability of successful transmission on slotted Aloha, not the total n_users number. PC is the index within the p_list of probabilities spaced apart in the list by 0.05 going from 0 to 1, so if n_coll(pc) is used, it's the number of collisions at that index during the transmission successes, failures, and empties that are counted for that probability iteration. Also, with the comment about using the "." to iterate over an array for an operator such as multiplication, I was not clear on how to use that here.

```
exponentValue = n_coll(pc) - 1;
exponentPart = (1 - p)^exponentValue;
expeff_v(pc) = n_coll(pc) * p * exponentPart;
```

could be written instead in one line as (??)-- sorry --not that experienced with MATLAB, although I have used the element-wise operator in past versions of this class (parts 1 and 2) occasionally:

```
expeff_v = n_coll .* p_list .* (1 - p_list).^(n_coll-1)
```

Any more help is appreciated! ;-) Thanks.

posted about 8 hours ago by KarenWest

Now apply Elaktrona's advice. The resulting (dashed) plot should track a previous curve calculated.

posted about 5 hours ago by _derrickb

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