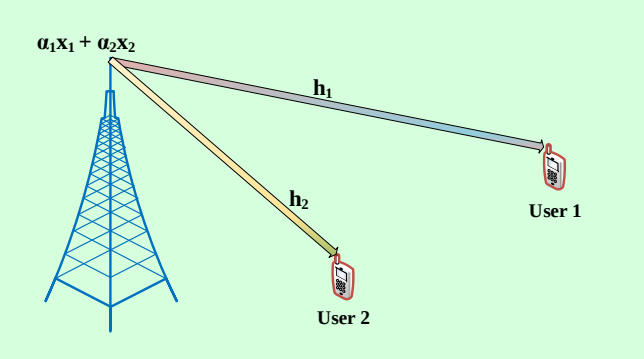
EEE F431 Mobile Telecom Networks (Second Semester 2024-2025)
Assignment-2 Tasks (11-04-2025), 4PM

Marks: 10

Task 1: MATLAB

- Prepare the report with MATLAB codes and plots.
- Bring the print out of the report during lecture hour on Friday 11 April at 4PM.
- There will be a short quiz on this assignment. The quiz will be open book (limited to the print out of report).
- After the quiz, handover the report to the invigilators.

1. An access point (AP) in a Wi-Fi system at 2.4 GHz intends to send data for two users (X_1 to user 1 and X_2 for user 2), as shown in the figure. Take $\alpha_1 = 0.9$, $\alpha_2 = 0.1$, and AWGN at both users has $\sigma_n^2 = 2$. Assume user 1 is at a distance of 40m and user 2 is at a distance of 30 m. Assume dipole antenna for both Tx and Rx.



   (a) Assuming Rayleigh fading channel, simulate $|h_1|$ and $|h_2|$ and verify the distribution by plotting histogram using MONTE Carlo simulations and PDF of $|h_1|$ and $|h_2|$.

   (b) Plot average SINR for user 1 and user 2 versus transmit power (0dBm to 20dBm) assuming Rayleigh fading channel for both channel 1 and channel 2.

Task 2: Research Paper

- Study the paper L. Dai, B. Wang, Y. Yuan, S. Han, I. Chih-lin and Z. Wang, "Non-orthogonal multiple access for 5G: solutions, challenges, opportunities, and future research trends," in IEEE Communications Magazine, vol. 53, no. 9, pp. 74-81, September 2015, doi: 10.1109/MCOM.2015.7263349.
- Bring the print out of the research paper during lecture hour on Friday 11 April at 4PM.
- There will be a short quiz based on the research paper. The quiz will be open book (limited to the print out of research paper).