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COMS 4, Section 39

Informative Speech Final Outline

1. Introduction

- A. Attention Getter: It wasn't too long ago that we adopted full-on online learning and needed to make use of our networks for this situation.
- B. Purpose: The purpose of my speech is to inform you about 5g.
- C. Salience: 5g would be important to know about and understand as it is a technology that we are gradually adopting.
- D. Credibility: I have learned about 5g in my AT&T internship last summer and so I can tell you a thing or two about it.
- E. Preview: I am going to talk about the evolution of the "generations", how 5g works, and the infrastructure 5g would use.

2. Body

A. Evolution Into 5g

- 1. According to Mesbahi and Rahbar (2019), "With the impressive success of mobile wireless communications in various generations (1G to 4G), wireless data traffic has grown dramatically over the past few years."
- 2. 1g gives us basic analog signal calls, whereas 2g gives us digital signal communication with encryption and some basic text messaging.

3. 3g gives us internet connection and allows for video calls, with a higher emphasis on filming. 4g allows for streaming and the ability to video call multiple people, like in Skype or Zoom.
4. 5g helps solve capacity issues with 4g, where many connections put a strain on the 4g network. It is mainly known for lower latency connections.

B. How It Works

1. According to Gaya et al. (2019), 5g uses higher frequency waves that are more easily absorbed and subject to things like “atmospheric and rain absorption, low diffraction around obstacles and penetration through objects” (*I will have a visual aid for this, so that the audience can understand it).
2. 5g uses MIMO (multiple input multiple output) systems, which are connections to more than one antenna (*There will be a visual aid, which will be used with point 3 and section C).
3. 5g chips can get 8-16 connections with base stations (cell tower antennas, *The visual aid for point 2 also works for this).

C. 5g Infrastructure

1. 5g “drives to use a large number of antennas” (Nalband et al., 2020) *The visual aid from section 2 will work for this
2. 5g will use small cell networks (*The visual aid from section 2 will work for this) to handle waves not being able to travel through objects.

3. Massive MIMO base stations (*The visual aid from section 2 will work for this) will be used for the capacity of 5g networks.

3. Conclusion

- A. Review of main points: I have just informed you about how we got to 5g, how the 5g network works, and the infrastructure 5g uses.

Works Cited

- Gaya, A., Jamaluddin, M. H., Kamarudin, M. R., & Ali, I. (2019). A wideband dielectric resonator antenna with a cross slot aperture for 5G communications. *Telkomnika*, 17(5), 2218–2225. <https://doi-org.proxy.lib.csus.edu/10.12928/TELKOMNIKA.v17i5.12801>
- Mesbahi, G., & Ghaffarpour Rahbar, A. (2019). Cluster-Based Architecture Capable for Device-to-Device Millimeter-Wave Communications in 5G Cellular Networks. *Arabian Journal for Science & Engineering (Springer Science & Business Media B.V.)*, 44(11), 9719–9733. <https://doi-org.proxy.lib.csus.edu/10.1007/s13369-019-03830-w>
- Nalband, A. H., Sarvagya, M., & Ahmed, M. R. (2020). Power saving and optimal hybrid precoding in millimeter wave massive MIMO systems for 5G. *Telkomnika*, 18(6), 2842–2851. <https://doi-org.proxy.lib.csus.edu/10.12928/TELKOMNIKA.v18i6.15952>