

CSE 515: Advanced Communication Networks and Systems (Assignment No. 1)

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We'll be pursuing a focus that bridges **agri-tech** with **smart, intelligent buildings** exploring how agriculture technologies and digital networking architectures can integrate into architectural design and innovation environments.

Selected Resources

- Title:** "AgriFusion: An Architecture for IoT and Emerging Technologies Based on a Precision Agriculture Survey" (IEEE)

Abstract: Precision Agriculture (PA) uses communication and information technologies to enhance farm productivity through optimal resource use. Leveraging Wireless Sensor Networks, AI/ML, and multidisciplinary innovations like fog/edge computing, SDN, big data, and nanotechnology, PA addresses challenges such as soil degradation, climate variation, and rising costs. This paper surveys these enabling technologies, introduces the AgriFusion architecture for cost-effective solutions, lists industrial applications, and proposes KPIs for PA, along with highlighting open research challenges and future directions. (*IEEE Xplore*, 29 September 2021)
- Title:** "Cloud Computing and Networking for SmartFarm AgriTech" (Wiley) [Link](#)

Abstract: This paper presents SmartFarm AgriTech, an IoT- and cloud-based system for remote farm monitoring and management. Using Raspberry Pi and Arduino with various sensors, relays, and motors, the system tracks crop, weather, and irrigation needs while enabling automated fertilizer spraying. Data is collected via AWS and ThingSpeak, accessible through a GUI for real-time control—addressing urban farmers' need to maintain farms without frequent on-site visits. (*Wiley*, 07 June 2022)
- Title:** Smart Agritech: Robotics, AI, and Internet of Things (IoT) in Agriculture (Book Chapter, Wiley) [Link](#)

Abstract: This chapter reviews IoT's role in transforming agriculture through improved efficiency, reduced waste, and higher yields. Emphasizing sensor-based systems for monitoring crops, soil, weather, and livestock, it discusses selecting suitable network protocols based on location. Real-world case studies from multiple countries illustrate global impacts, while future prospects point to AI- and ML-driven innovations for sustainable, high-productivity farming. (John Wiley & Sons, 1 Oct 2024)