

## **DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

### **III B. TECH II SEMESTER**

<b>BATCH 2023-27</b>	<b>MINI PROJECT 2025-26</b>	<b>ACADEMIC YEAR 2025-26</b>
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**Batch Id** : 23MPCS-F20

**Title of the Project** : Digital Twin of a Classroom for Attendance + Behaviour Analytics

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#### **GUIDE DETAILS**

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<b>Area of interest</b>	:	Data science and cyber security

***Signature of the  
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***Signature of the  
Project Coordinator***

**Batch Id** : 23MPCS-F20

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### **Objectives**

1. Develop a digital twin system to automatically monitor and record student attendance in real-time, reducing manual errors.
2. Analyze student behavior and engagement during classes to provide insights on participation and learning patterns.
3. Generate predictive reports from attendance and behavior data to help optimize teaching strategies and classroom management.

### **Outcomes**

1. Significantly reduced administrative effort and time associated with exam management and evaluation.
2. The system saves time on automatic attendance and quickly highlights student engagement, allowing teachers to manage classes more efficiently.
3. The system monitors student behavior in real time and identifies whether students are attentive or distracted, helping teachers address engagement issues promptly.

### **ABSTRACT**

This project aims to create a **Digital Twin of a Classroom** to automate attendance tracking and analyze student behavior. The system uses real-time data to monitor student presence, reducing manual errors and ensuring accurate records. Additionally, it evaluates student engagement, participation, and behavioral patterns during class sessions, providing actionable insights for educators. By integrating predictive analytics, the platform can generate reports that assist teachers in identifying students who may need extra support and in optimizing teaching strategies. Overall, this project leverages digital twin technology to enhance classroom management, improve learning outcomes, and support data-driven educational decisions.

**REFERENCES:**

- [1] Tao, F., Zhang, M., Liu, Y., & Nee, A. Y. C. (2019). **Digital Twin in Industry: State-of-the-Art.** *IEEE Transactions on Industrial Informatics*, 15(4), 2405–2415. Yong-Sheng, Z. “The Research and Design of Online Examination System.” IEEE, 2015. DOI: 10.1109/ARES.2006.14
- [2] Fuller, A., Fan, Z., Day, C., & Barlow, C. (2020). **Digital Twin: Enabling Technologies, Challenges and Open Research.** *IEEE Access*, 8, 108952–108971. “Online Examination Management System.” International Research Journal of Modernization in Engineering Technology and Science, Volume 4, Issue 6, June 2022
- Grieves, M., & Vickers, J. (2017). **Digital Twin: Mitigating Unpredictable, Undesirable Emergent Behavior in Complex Systems.** *Springer*

**Date of Submission:**

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