Seminar Topic Summary Report

Tentative Cover Page

Institution Name: Basaveshwar Engineering College, Bagalkot

Department of Computer Applications (M.C.A)

Course: MCA

Semester: II

Seminar Topic : Automation Weapons

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1. Introduction

Autonomous weapons systems (AWS)—often called lethal autonomous weapons systems (LAWS) or "killer robots"—are military platforms equipped with AI, sensors, and algorithms that can independently detect, select, and engage targets without direct human intervention. These systems can operate after activation without ongoing human inputExamples include drones, sentry guns (like South Korea's SGR-A1), naval defense systems (e.g. Phalanx, Iron Dome), and even loitering munitions

2. Seminar Topic Details

This seminar explores the tension between military advantages—like rapid reaction and reduced soldier risk—and ethical/legal challenges, including accountability, the risk of civilian harm, and the moral consequences of delegating kill decisions to machines . A breakdown of autonomy levels—human-in-the-loop, human-on-the-loop, and human-out-of-the-loop—and how each impacts compliance with international humanitarian law. Discuss governance options ranging from partial regulation to complete bans .

3. Topic Summary

Systems (e.g., drones, sentry guns, naval interceptors) that can autonomously detect, select, and engage targets once activated—ranging from "human-in-the-loop" to fully autonomous "human-out-of-the-loop" modes.Powered by AI and sensor fusion, these systems use algorithms to perceive, decide, and act in real time. Some—like South Korea's SGR-A1 or shipboard CIWS—respond autonomously for speed .

4. Relevance to MCA Curriculum

Core Linkages: Autonomous weapons rely on AI techniques covered in MCA courses—search algorithms, knowledge representation, and intelligent agent design—as systems must perceive, reason, and act in real time. **Technical Application**: These systems often use deep learning and reinforcement learning for perception and control—e.g., target recognition, navigation, and adaptive behavior.

5. Learning Objectives

Define autonomous weapons and differentiate autonomy levels: *human-in/on/out-of-the-loop*recognize and address prevalent mobile security issues such as insecure Identify types of LAWS (drones, sentry guns, CIWS) and their functional roles .

Explain key technologies: AI algorithms, sensor fusion, real-time decision-making, fault tolerance

6. Expected Outcome

Autonomous systems can engage threats (like missiles or drones) within milliseconds, often faster and more accurately than humans, reducing friendly-force exposure. AI-armed drones and robot platforms can amplify combat power. For instance, Ukraine's AI-enhanced drones hit targets 3–4× more accurately, reducing operator workload and exposure

7. References

Mobile Security authored by **Susanne Beck** in **2016**

8. Signatures

Coordinator Signature: **HOD Signature:**