

Contents

[4.10] Emotional Contagion Effects 1

[4.10] Emotional Contagion Effects

1. Operational Definition: The rapid spread of negative emotional states (e.g., panic, frustration, cynicism) through a team or organization, amplifying individual affective vulnerabilities and leading to collective, correlated degradation in security performance.

2. Main Metric & Algorithm:

- **Metric:** Emotional Synchrony Index (ESI). Formula: $ESI = \text{Cross-Correlation}(\text{Team_Member_A_MTTA}, \text{Team_Member_B_MTTA})$. We measure the correlation of performance metrics across team members over time.

- **Pseudocode:**

```
python

def calculate_esi(metric_log, team_list, time_period='30d'):
    """
    metric_log: A time series of a performance metric (e.g., MTTA, Ignore Rate) per analyst
    """
    # Calculate the metric for each team member over the time period
    analyst_metrics = {}
    for analyst in team_list:
        analyst_metrics[analyst] = calculate_mta_for_analyst(analyst, time_period)

    # Calculate the pairwise correlation between all team members
    correlation_sum = 0
    pair_count = 0
    analysts = list(analyst_metrics.keys())

    for i in range(len(analysts)):
        for j in range(i+1, len(analysts)):
            corr = pearson_correlation(analyst_metrics[analysts[i]], analyst_metrics[analysts[j]])
            correlation_sum += corr
            pair_count += 1

    # ESI is the average correlation across all pairs
    esi = correlation_sum / pair_count if pair_count else 0
    return esi
```

- **Alert Threshold:** $ESI > 0.7$ (Strong positive correlation in performance degradation across the team, suggesting emotional contagion).

3. Digital Data Sources (Algorithm Input):

- **SIEM/Ticketing System:** As in 4.1, to calculate individual MTTA, Ignore Rate, or other performance metrics over time.

4. Human-to-Human Audit Protocol: Observe team communication channels for patterns of negative, absolutist language (“This is hopeless,” “Everything is broken”). Conduct team retrospectives focused on psychological safety and group dynamics.

5. Recommended Mitigation Actions:

- **Technical/Digital Mitigation:** Use the ESI metric as an early warning system to trigger management intervention.
- **Human/Organizational Mitigation:** Train team leads in emotional intelligence and group facilitation. Introduce team resilience exercises.
- **Process Mitigation:** Create clear protocols for team leads to initiate a “reset” after a difficult period, such as a facilitated debrief or a change in rotation.