Alerting and Controlling Criminal activities using a Nanorobot

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CCS CONCEPTS • General and reference •Computing methodologies~Machine learning~Learning paradigms~Reinforcement learning

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1 INTRODUCTION

As the crime rate is increasing, the need for a safer environment is unavoidable. Statistics show that abuse is one of the major problems prevailing. Innocent people are often being attacked and killed by criminals. Sometimes, the criminals even harm themselves. With the proliferation of technology, it is now possible to predict the occurrence of crime before it can occur. Using a Nanorobot, it is easier to find the crime triggering event in three categories of people – 1. A person who is good in behavior. 2. A person who is partially good but has intergenerational transmission of criminal behavior. 3. A person who is impulsive by nature and grew in a criminal environment. The proposed research addresses the current problem and the proposed solution is to embed a Nanorobot that sends an alert message to the near-by crime control organization and also controls the criminal which provides an opportunity for the victim to escape.

1.1 Methodology

The cognitive and behavioral problems of a psychopath, such as poorly formulated plan, self-guideline, and formation of balanced expectancies controlled by those pre-frontal-limbic circuits are firmly connected with the advancement of slow cortical potentials (SCP) present at the cortical surface 12,30-32. SCPs consist of polarized slow potentials which are negatively or positively polarized and are recorded with EEG amplifiers portrayed by long-time constants. Electrical negative SCP shifts imply excitatory mobilization, while electrical positive SCP shifts imply a reduction of neuronal preparation.

Based on brain self-regulation studies using neurofeedback of SCP related to misregulation of cortical activity thresholds and proof of inadequate cortical functioning in psychopathy, a neurobiological perspective is favorable in the successful treatment of psychopathy. The aftereffects of our intensive brain regulation intervention show that psychopaths can control the sensitivity of front-central brain areas. After SCP self-regulation training, there is a notable reduction in aggression and impulsive nature as well as enhancement in

behavioral-inhibition and increased cortical sensitivity for error-processing. The study portrayed significant enhancements on the neurophysiological, subjective, and behavioral levels in critical psychopaths. Post-SCP-neurofeedback training, a treatment based on neurobiology for a submissive group of psychopaths.
The application of the present study on a class of violent psychopaths revealed that offenders who are scoring high can willfully gain control over their cortical activity. The physiological functioning of the SCP-front-central system contains triggers to various cortical target regions sensitive for regulating behavior through the cognitive system. The major behavioral problem of psychopathy is the absence of preliminary allotment of attentional resources to adjusting behavior. The attained SCP-self-regulation performance of the psychopathic group 30,40,45-49 is comparable with that of the samples of ADHD, prefrontal lesions, and epilepsy portraying more distinct feedback.

1.2 System Architecture

System Architectures for Severity of criminal behaviors i.e High, Medium, and Low. Suppose that there are n classes of Triggers, C1, C2, ..., Cn, and each data sample is represented by n-dimensional and symptoms of Emotional Triggers, S= {S1, S2, …, Sn}.

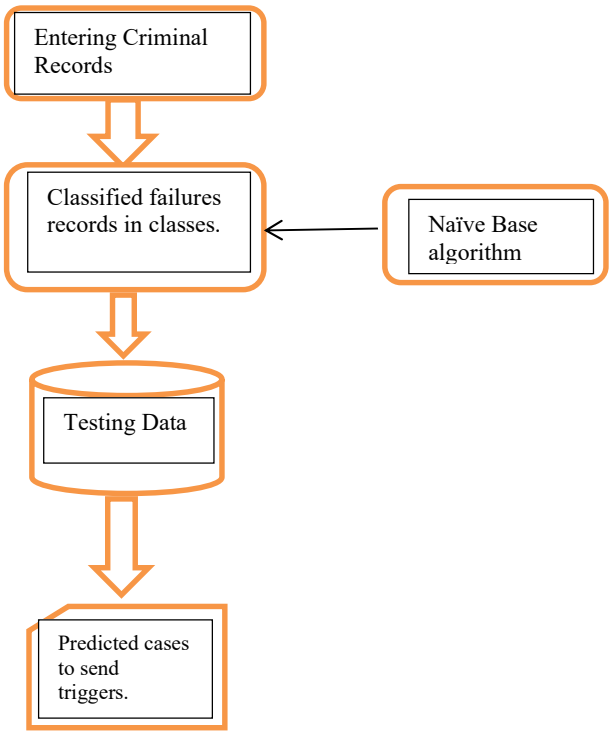

Figure 1: System Architecture.

Step 1: To calculate the probability of the type of Trigger.
First, recognize the symptoms of the specific Trigger.
P (C1|S1, S2, ..., Sn).

Step 2: To calculate the probability of each symptom = P(Si|C1)
Where i= {1, 2, …, n}

Step 3: Multiply each probability of symptoms together Probability of
C1 = P(S1|C1) * P(S2|C1) * … * P(Sn|C1)

Step 4: Repeat step 1 to Step 3 for each trigger class.

Step 5: Predict that S belongs to the type of trigger which is having the highest posterior probability. P (Ci| S) > P(Cj>S) for all 1< = j < = n and j != i.
This displays the risk of one of the types of a trigger from a predefined set of classes.

The Naïve Base algorithm plays a vital role in the necessary information mining. Based on the above-mentioned algorithm and computed risk of trigger generation, some tests will be prescribed to confirm the presence of Triggers in Criminals.

2 WEIGHTED DECISION-MAKING MODEL

2.1 Model Structure

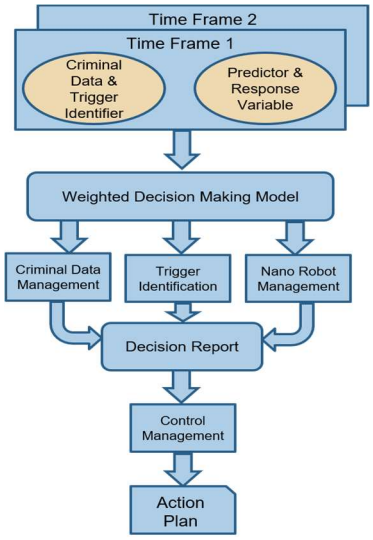

Figure 2: Weighted Decision-Making Model to formulate an action plan based on the weightage of identified triggers.

Conditional Probability Matrix

Here the use of triggers in identifying criminals (*Low, Medium,* and *High* density).

Total W (I) = Low +Medium+ High = (x+1) +3x+6x

Logical formulations:

Sum of rows (i) =$\sum_{j=1}^{n}(x_{ij})$

Sum of Columns (j) =$\sum_{i=1}^{m}(x_{ij})$

2.2 Weighted Severity Indexing

The criminal psychopaths in this study are categorized into 3 categories based on their severity. They are criminals with low, medium, and high severity indexes. The low criminal psychopaths are people from a decent background. A medium-indexed criminal psychopath is partially good but has intergenerational transmission of criminal behavior. A high indexed criminal psychopath is impulsive by nature and growing in a criminal environment. The data of criminals are collected and are processed. The nanorobot is trained to identify the base trigger for their crime-committing tendency. The identified trigger is then used to perform control management using the nanorobot and an alert is sent to the near-by crime control organization.

The weights for severity index on a scale of 1-9 are:

Table 1: Weighted index based on the type of criminal.

Type of Criminal	Level of Criminal	Environment	Weight Classification
Type-1	High indexed	Aggressive by nature and criminal environment.	1,2,3
Type-2	Moderate indexed	Intergenerational transmission of criminal behavior.	4,5,6
Type-3	Low indexed	Good behavior but impulsive	7,8,9

2.3 Resulting Characteristics

High-performance parameters are being achieved by the following characteristics.

- **Accuracy**: The model offers to add and remove decision variables for each case of the criminal psychopath based on his personality and history. This makes the model more accurate basing on the trigger. It is effective in reducing the crime rate.

- **Performance**: This model can work on multiple time frames. Basing on the intensity of the criminal the performance metrics can be calculated.

- **Simplicity**: The algorithmic steps are easy and feasible to implement and are based on simple mathematical formulae. Similarly, action plans act as alleviating plans for the unavoidable situation.

- **Efficiency**: The attractive part of the model is that it gives high efficiency and great potential to reduce the crime-rate and it also helps the possible victim to be safe.

3 PREDICTIVE MODEL

- Crime control mode choice model development.
- Intended to give alerts to crime control organization, and decision-making process to regulate control measures to save the possible victim.
- The proposed method is a customized Multinomial Logit model.
- The model is expressed to predict the severity index of criminal in the term of trigger variables and some environmental parameters as coefficients.
- The best part of this model is the flexibility of adding and removing independent variables.

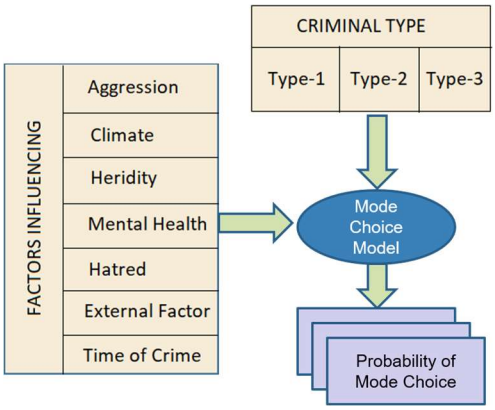

Figure 3: Predictive model based on Influencing Factors and Type of Criminal.

The set of dependent variables and predictors are inputs to the model.

Step 1: Calculate the utility of each mode by a standard formula.

$$U(m) = b(m) + \sum_{i=1}^{n=8} b_i * X_i(m)$$

Step 2: Calculate the exponent of utility calculated in step 1.

$$Exp(U(m))$$

4 NANO ROBOT AUTOMATION

This work has an innovative approach for the development of Nanorobots with sensors for controlling Criminals in attempting crimes. The Nanorobots operate on the thermal and chemical control techniques in a virtual environment. Nano bioelectronics is the base for the manufacturing of integrated system devices with embedded Nano biosensors and actuators, which forms the Nanorobot architectural model. This model facilitates its application for target trigger identification and successful controls. The Nano robot's effectiveness in sending the alert shows how the system's actuation is improved based on trigger identification capabilities. Therefore, our work addresses the control and the architecture design for developing trigger sensing and alerting machines. The advancements in nanotechnology are enabling the manufacturing of Nanorobots through Nano-bioelectronics. The analysis of the system modeling is the major aspect for supporting the fast development of nanotechnology in the fields of molecular machines. The Nanorobot choices on sensing the trigger, hardware architecture design, and control methodology is done based on 3D simulation.

5 RESULTS

- Define interface between crime trigger and alert-control system which act as strategic planning to inform the crime control organization thereby reducing crime events.
- It helps to predict the occurrence of the crime event before it can occur and prevent it.
- It helps in identifying the criminal psychopath and makes it possible to treat them using cognitive behavioral therapy.
- The resultant predictions are shared between the crime control organizations and also stored in the main database, which helps to train an even accurate and efficient model.

6 SPECIALIZED OUTCOMES

- Benefits to all crime control organizations, possible victims, and authorities.
- **Efficient Operation:** Constantly training the nanorobot, dynamic, and smart alerting system based on the trigger event.
- **Complete Integration:** Improved level of service (LOS), visibility, and high intelligence operation using Nanorobot + Machine Algorithms.
- **Better harmony:** The integration of the nanorobot with the criminal psychopath helps us in preventing crime and making the world a better place to live.

7 CONCLUSION

- Nanorobot is a real-time controller that operates with 90% accuracy. It is highly reliable and doesn't give any false alerts in identifying the crime trigger. This helps in controlling the crime rate and helps in reducing the criminal behavior of the person by cognitive behavior therapy or other such practices.

- Smart technological solutions using nanobots and machine algorithms to increase the accuracy and dynamically train the model.
- Nanobots help in implementing practical and long-term solutions which help in effectively lowering the crime-rate and restore harmony.

REFERENCES

[1] J. Angwin, J. Larson, S. Mattu, L. Kirchner, Machine bias.ProPublica, May 2016; www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing.

[2] B. Moore, P. Panousis, V. Kulkarni, L. Pyeatt, A. Doufas, Reinforcement learning for closed-loop propofol anesthesia: A human volunteer study. In Proceedings of the Twenty-Second Innovative Applications of Artificial Intelligence Conference (2010), pp. 1807–1813; www.aaai.org/ocs/index.php/IAAI10/paper/view/1572/2359