

Machine Learning for Early Mental Health Support and Offenders Correction

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Abstract

The effective rehabilitation and supervision of law offenders are vital to promoting community safety and enabling individuals to reintegrate into society. Community supervision presents several challenges for agencies like the Adult Parole Authority (APA), which must oversee individuals released from prisons under various forms of supervision, including courtesy supervision for different counties and interstate compact cases. With such a large number of individuals under supervision, the APA struggles to provide adequate oversight and support to guide individuals towards positive behavioral changes and reduce the risk of recidivism. To address these challenges, this paper proposes a machine learning-based system designed to monitor and support individuals under community supervision. The model would track various indicators to identify individuals at risk of self-harm or harming others and enable the APA to provide timely and appropriate support to these individuals. Improving the monitoring and support offered during the rehabilitation and supervision period would enhance the effectiveness of community supervision and contribute to safer and more stable communities.

Introduction

At year-end 2018, more than 6.5 million people were on probation or parole (Maruschak and Minton 2020). In Ohio, the Adult Parole Authority (APA) supervises individuals released from Ohio prisons with supervision, courtesy supervision for 18 counties and their common pleas courts, and interstate compact cases. Four hundred eighty-seven parole officers are supervising approximately 32,000 offenders. Without these interventions, high-risk offenders are more likely to engage in offensive behavior and less likely to succeed on supervision, especially if they develop mental health problems. Effective community supervision is particularly important for high-risk offenders who may be more likely to engage in offensive behavior and less likely to succeed on supervision, especially if they experience emotional/psychological well-being problems. Therefore, monitoring and addressing emotional well-being is crucial for reducing crime and self-harm among individuals un-

der community supervision (Lamberti 2016). Offering services that help offenders cope with stressful situations, manage volatile emotional states, learn prosocial thinking and behavior patterns, and increase the achievement of prosocial goals may reduce the hardship of individuals and increase their chances of a successful period of community supervision, and decrease their risk of future recidivism.

In this paper, we proposed a machine learning-based system to better manage released offenders' criminogenic and emotional/behavioral well-being needs. Mainly focusing on depression, anxiety disorders, and addictive behaviors are the most likely source of emotional/psychological well-being disorders. The proposed system effectively monitors the current well-being of individuals through their correction period and notifies supervision officers of their immediate and emerging needs. Then, the APA experts take the necessary actions to provide help and supervision for the offenders under the supervision. The proposed system will assist the APA in supervising a large number of offenders and provide them with the required attention and help in case of developing issues. Thus, the likelihood of re-offense or self-harm will be reduced significantly.

Proposed System

To provide more flexibility and comfort for individuals using the proposed support correction system, it is designed to be easily accessible by users from different locations. This is especially important during and after the COVID-19 pandemic, as travel may not be feasible or safe for many people. By removing the requirement for in-person visits or travel, the system can offer a more convenient and user-friendly experience for those who need to use it. The system will be based on a chatbot (Adamopoulou and Moussiades 2020). The proposed support correction system consists of seven components: the users, chatbot, questions library, analyzer system, machine learning system, reporting mechanism, and the APA. Figure 1 shows a diagram of the monitoring system. The users are assigned login credentials that APA assigns to maintain the privacy of the users without revealing their personal information with the proposed system. The chatbot will work as the virtual interface between the user and the machine learning system. The chatbot will provide the first question using the default first question in the questions library. Then, the entered answer by the user will be

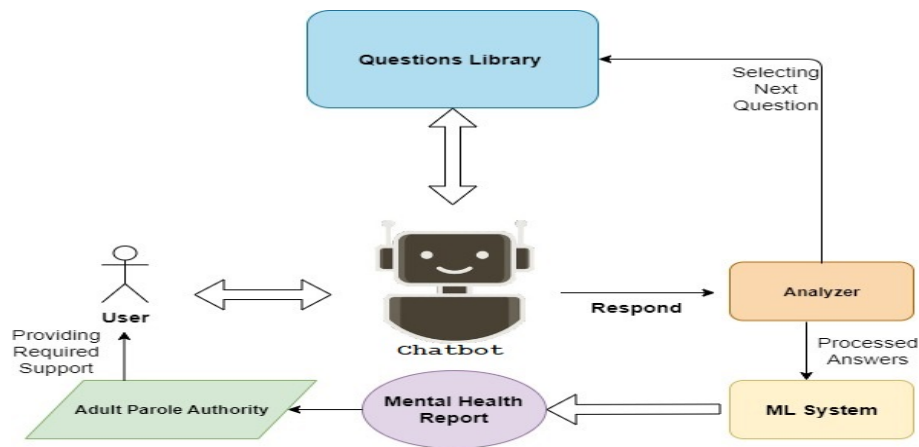


Figure 1: The proposed support correction system for early detection of emotional/psychological/behavioral well-being issues for individuals under supervision.

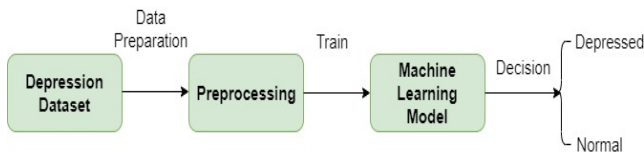


Figure 2: The machine learning system design stage.

filtered and analyzed using the analyzer. The analyzer performs two main tasks: i) creates the decision regarding the following question to select from the questions library to provide to the user based on the user's previous answer, ii) provides the processed answers to the machine learning system. The questions library consists of groups of questions that address different criminogenic/emotional/psychological issues. These questions are designed using medical professionals (Diez-Quevedo et al. 2001), (America 2023). Collecting these questions in a chatting way brought to attention more information about the well-being status compared to multiple choices. However, the analyzer must perform a natural language processing task to preprocess and analyze the user answers to select the following questions from the questions library. The machine learning system is trained prior to being applied to the support correction system. The machine learning training process is shown in Figure 2. The machine learning system provides the probability of the likelihood that the user has any disorder or is likely to develop any well-being or behavioral disorders. Then, the system creates a report to the APA containing the current status of the individuals with recommendations. Finally, the APA provides the required support and supervision for the individuals under supervision based on the identified measures.

Conclusion

This short abstract proposed an efficient system to monitor the well-being status of individuals under supervision. The system is based on a chatbot designed to address any disorders that might lead to recidivism or self-harm. Medical

professionals create the questions for the chatbot. The proposed system analyzes the individual's responses to suggest the required follow-up questions. It provides the analyzed responses to the machine learning system that creates a status report, which the APA can use to provide the appropriate support and help to the individuals under supervision. The proposed model accelerates the process of mentoring individuals by providing early detection of problems during the supervision period.

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