

**HOW TO CREATE A PREDICTIVE POLICE MODEL FOR POLICE FORCE  
MANAGEMENT?****THE CHALLENGE**

Every day, an average of 620 police force units operate in Lithuania. The work scheduling for forces, the formation of tasks and the planning of patrol planning is assigned to the responsible officials in different units. To plan the work of the forces properly, it is necessary to evaluate a lot of different data – without the use of automated tools, it is complicated, so the planning is done subjectively. We often find that the working hours of most forces do not coincide with the peak times of events. In addition, the deployment of forces is often not linked to the likelihood of events in a particular area, which means that too much time is wasted going to the scene, violations of the law are not prevented, and offenders are not detained. This problem is relevant for both for the Lithuanian police and the public – during the surveys, the respondents negatively evaluate the activities of the police, the officers are viewed as "not operative, drove to the scene for a long time, did not catch criminals". **Challenge** – make maximum use of the data available to the police and other authorities, based on which the need for forces is automatically provided for a specified period, and the forces are provided with the routes and locations.

**SOLUTION**

A prototype of an artificial intelligence algorithm is needed, which, based on the available data, can perform two main functions:

- a) to submit a forecast of events, a proposal on how to predict the deployment of forces in terms of time and territory;
- b) to automatically generate routes (tasks) for the forces on the map, taking into account both the previously received data and the changing situation on the route.

The solution must allow the user to select a forecasted period for creating force schedules (e.g., forecast of required forces for the next day, week, month). Also, the solution must be able to use a variety of data sets administered by both the police and other authorities from a variety of sources, such as:

- 1) Register of events registered by the police (PRJR);
- 2) Register of Administrative Offenses (ANR);
- 3) Departmental Register of Criminal Offenses (NVŽR);
- 4) Traffic accident information system (EJIS);
- 5) Vehicle flows on the roads (Traffic meters of State Enterprise Lithuanian Road Administration);
- 6) Weather forecast;
- 7) Planned events;
- 8) Tasks assigned to the force;
- 9) Data sets formed by police officers (individual files in machine-readable formats);
- 10) Other open data.

The solution must make it possible to extend the list of data sources. When planning a route for a specific force, the decision algorithm must take into account the above data sources, including the tasks formed by the commanders of the forces that they will have to perform during patrols (e.g., screening of self-isolated persons, servicing of summonses, interview, etc.). It must be possible to provide feedback on the results obtained in order to make it more accurate in the future.

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The solution must be able to use criminological research data (models) that analyse the causes and conditions of violations of the law (for example, statistics on employment, education, other factors influencing violations of the law, etc.). The solution must be as automated as possible without the need for constant maintenance. It must be possible to implement the solution in container infrastructure e.g. "Docker". The developed solution must have an application programming interface (API), which would allow it to be easily integrated into existing systems. It should be noted that the prototype solution will not be integrated into existing force management systems.

**MEASURES OF SUCCESS**

Indicators:

- reduced response time to incidents (compared to previous periods);
- violations of the law are detected more effectively when responding to population reports – more violations of the law have been identified, more persons are detained in "hot footprints" (reactive policing);
- the solution will have a preventive effect – violations of the law in public places will decrease (proactive policing).

**FUTURE OPPORTUNITIES**

A successful solution could be used by both Lithuanian and foreign law enforcement agencies. The feasibility of procuring the solution would be assessed by appropriate cost-benefit analysis.

**ADDITIONAL INFORMATION**

The developers of the solution will be provided with anonymised data sets held by the police in CSV or other compatible formats from PR|R, E|IS and other registers and systems.

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