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**SMART CLOTHING FOR SAFETY AND HEALTH:  
INNOVATIONS FOR EMERGENCY SERVICES  
AND INDIVIDUALS IN CRITICAL SITUATIONS****УМНАЯ ОДЕЖДА ДЛЯ БЕЗОПАСНОСТИ И  
ЗДОРОВЬЯ: ИННОВАЦИИ ДЛЯ СЛУЖБ  
ЭКСТРЕННОЙ ПОМОЩИ И ЛЮДЕЙ В  
КРИТИЧЕСКИХ СИТУАЦИЯХ***Khlystou G.G.\* , Tkachou A.A.\*\* , Lednitskiy A.V.\*\*\***Belarusian State Technological University, Belarus**e-mail: gleb.offical@gmail.com\* , tk2007m@mail.ru\*\* , ledniz@inbox.ru\*\*\***Хлыстов Г.Г.\* , Ткачёв А.А.\*\* , Ледницкий А.В.\*\*\***Белорусский государственный технологический университет,**Республика Беларусь**Keywords: clothing, artificial intelligence, technology, safety, health.**Ключевые слова: одежда, искусственный интеллект, технологии, безопасность, здоровье.*

*Abstract. This article explores the possibility of using smart clothing integrated with artificial intelligence (AI) to improve the safety and health of emergency workers and people in critical situations. Modern technologies and AI make it possible to create clothes equipped with sensors that monitor various vital and physical indicators. The machine learning and deep learning algorithms used in AI analyze data collected by sensors and provide valuable information to first responders and those in critical situations. The study also examines examples of successful use of smart clothing in emergency scenarios and highlights the importance of further development of this technology to ensure safety and health in critical situations.*

*Аннотация. В данной статье исследуется возможность использования умной одежды, интегрированной с искусственным интеллектом (ИИ), для повышения безопасности и здоровья сотрудников экстренных служб и людей, находящихся в критических ситуациях. Современные технологии и ИИ позволяют создавать одежду, оснащенную датчиками, которые мониторят различные жизненные и физические показатели. Алгоритмы машинного обучения и глубокого обучения, используемые в ИИ, анализируют данные, собранные датчиками, и предоставляют ценную информацию для экстренных служб и лиц в критических ситуациях. Исследование также рассматривает примеры успешной эксплуатации умной одежды в экстренных сценариях и подчеркивает важность дальнейшего развития этой технологии для обеспечения безопасности и здоровья в критических ситуациях.*

### **Smart clothes and AI**

In our fast-changing world, modern technology and artificial intelligence (AI) not only improve our daily lives, but also have enormous potential to solve critical problems. One of the cutting-edge innovations that comes to the rescue in emergency situations and takes care of health is smart clothing integrated with AI and equipped with advanced sensors.

#### **Using various sensors**

The main characteristic of smart clothing that makes it a true innovation is the presence of built-in sensors. These sensors are designed for a variety of functions and tasks, including environmental monitoring, monitoring vital signs and even continuous monitoring of blood glucose levels. Let's look at how different types of sensors provide safety and health care in different scenarios.

**Environmental sensors:** Smart clothing can be equipped with sensors to monitor the environment, such as toxic gas levels, temperature and humidity. This allows you to warn of possible hazards, such as fires or chemical leaks, and take appropriate safety measures.

**Vital Signs Sensors:** Sensors built into smart clothing can continuously monitor vital signs such as heart rate, blood pressure, and blood oxygen levels. This information can be sent to a medical monitoring station, allowing you to quickly respond to changes in health status.

**Glucose Monitoring:** For diabetics, smart clothing can be equipped with sensors to continuously monitor blood glucose levels. If your glucose level changes, the system alerts you to the need to take action, ensuring stable blood sugar levels.

#### **The role of artificial intelligence**

The machine learning and deep learning algorithms used in AI analyze data collected by sensors and provide valuable information to first responders and those in critical situations. This allows you to automatically identify dangerous situations, predict developments and provide recommendations to ensure safety.

Smart clothing, integrated with artificial intelligence and equipped with advanced sensors, is an innovative technology that opens up new opportunities to improve safety and health in various areas of life. In the following examples, we will look at how this unique combination of technologies can be successfully applied in emergency situations, emergency medical services and the daily life of diabetics, helping to improve quality of life and ensure safety in critical situations.

#### **Examples of successful use of smart clothing**

**In the field of the Ministry of Emergency Situations:** Smart clothing integrated with artificial intelligence can be used to improve the safety of rescuers and firefighters. For example, in the event of a fire, sensors in clothing can monitor the level of toxic gases in the environment and warn of possible danger. This allows rescuers to make more informed decisions and reduces risks to their health.



Picture 1 – Example of usage of smart-clothing

In the emergency medical field: Smart-clothing can be used to improve patient care in emergency medical services. For example, sensors in clothing can monitor a patient's vital signs, such as pulse and blood pressure, and automatically transmit this data to medical personnel. This helps to quickly and accurately diagnose the patient's condition and begin treatment.

In the daily life of diabetics: Smart clothing can be used by diabetics to more conveniently and effectively control their condition. For example, it can automatically adjust insulin levels based on measured glucose levels, ensuring stable blood sugar levels and preventing acute conditions. This can significantly improve the quality of life of diabetics.

#### **Technologies used to implement sensors**

To transmit data from built-in sensors, smart clothing uses wireless technologies such as Bluetooth, Wi-Fi, NFC or special low-power radio frequency modules. These technologies provide reliable communication with external devices such as smartphones, walkie-talkies, tablets or medical devices for monitoring and data analysis.

Smart clothing is often equipped with protective layers that provide resistance to moisture and external influences. This allows the garment to be used in a variety of conditions, including rain or snow. In addition, sensor power and charging systems are integrated into clothing and their batteries can be recharged in safe environments using standard power sources such as city power lines, or using wireless chargers in emergency situations, allowing for fast and efficient charging.

#### **Conclusion**

The research raises the important issue of using smart clothing integrated with AI to improve the safety and health of emergency workers and people in critical situations. Using modern technologies and machine learning algorithms, such clothing can be equipped with sensors capable of monitoring various aspects of life and physical condition. The study's findings highlight the potential of smart clothing to collect and analyze data, which could provide valuable information to first responders and those in sensitive situations. Examples of the successful use of such clothing in emergency scenarios are given, which emphasizes the

relevance and promise of this technology in ensuring safety and health in critical situations. Further development in this area is necessary to more effectively respond to emergency situations and improve overall safety.

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## **MODERNIZATION OF RAILWAY STATION INTERIORS**

## **МОДЕРНИЗАЦИЯ ИНТЕРЬЕРОВ ЖЕЛЕЗНОДОРОЖНОГО ВОКЗАЛА**

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*Ключевые слова: интерьер, общественное пространство, дизайн-проект, модернизация.*

*Abstract. The main objective of the project is the preservation, reconstruction and modernization of the premises of the Gomel-Passenger station, which do not correspond to the new socio-cultural realities and have practically lost the targeting of their use. The work set the task of creating a design layout for modernizing the premises of the waiting room, VIP-lounge, as well as developing a station for charging a phone.*

*Аннотация. Основной задачей проекта является сохранение, реконструкция и модернизация помещений вокзала станции «Гомель-Пассажирский», которые не соответствуют новым социокультурным реалиям и практически потеряли адресность своего применения. В работе поставлена задача создания дизайн-макета модернизации*