MAKING SURE AEDS WORK WHEN NEEDED

PRESS RELEASE

World Restart a Heart Day 2023: Research project »HerzKISO - Heart Safe Cities through AI-based Location Optimisation of Defibrillators«

World Restart a Heart Day takes place on the 16th of October every year and aims to raise global awareness of the importance of out-of-hospital cardiac arrests. The joint research project »HerzKISO« by CardiLink and Fraunhofer IIS is also dedicated to the topic of heart safety: Its mission is to make an important contribution to the installation and availability of automatic external defibrillators in public spaces.

Sudden Cardiac Arrest
Within the EU, almost half a million people die as a result of sudden cardiac arrest every year. The rapid and targeted use of AEDs (Automated External Defibrillators) is an effective way to significantly increase the chances of survival. For this reason, the widespread distribution, easy location and public accessibility of defibrillators are essential.

Ensuring Comprehensive Availability of Defibrillators
In spring 2023, the joint research project »HerzKISO - Heart-safe cities through AI-based location optimisation of defibrillators« was launched by CardiLink GmbH and the Fraunhofer IIS Supply Chain Services working group. The project will run until spring 2026. The goal is to ensure an unbiased and comprehensive availability of defibrillators in order to provide as many citizens as possible with access to a life-saving device and thus create the technical basis for making cities in Germany and Europe heart-safe. – In addition, enough residents need to be familiarised with resuscitation measures. This is also the aim of the initiatives around the World Restart a Heart Day to train as many people as possible in these measures.

»HerzKISO«, on the other hand, is developing a planning concept that is transferable to other areas and thus a new procedure for optimal location planning and distribution of AEDs. So-called imputation methods create a database based on publicly available sources, on the basis of which the optimal locations for AEDs are determined through mathematical optimisation.

A key challenge is to create a complete, temporally and spatially accurate data set by developing and applying suitable imputation methods. Depending on the quality of the available data, this imputation can range from simple, classical methods to complex, deep-learning-based image classification algorithms. For a mostly complete data set, for example, it may be sufficient to replace missing location data with its statistical mean. A more

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incomplete data set, on the other hand, requires estimating the missing location data from raw data such as images using complex algorithms.

With the help of the methods mentioned, a recommendation for the optimal number of AEDs to be placed is generated, which ensures a non-discriminatory, comprehensive availability of the defibrillators in a mathematically sound manner. The integration of data on the condition of the defibrillators guarantees that they are also ready for use in an emergency.

The Consortium Partners
The consortium leader is CardiLink GmbH, based in Fürth. It has developed a manufacturer-independent Internet-of-Things (IoT) platform. Using intelligent, battery-powered sensors, the status and location of the AEDs is transmitted to the platform on a daily basis. This ensures that automatic external defibrillators in public spaces are ready for use and can be locatable at all times. CardiLink is now in use in more than 30 countries worldwide.

The Fraunhofer IIS working group for supply chain services is contributing its expertise in methods and procedures for application-oriented data analytics and AI. As described, mathematical optimisation methods and imputation methods are used in the project.

From Fürth to the World: A Demo Tool to Illustrate Location Placement
The project results are presented by means of an interactive demo tool for the optimal location placement of AEDs using the city of Fürth, in Germany, as an example. In addition to the location factors relevant for Fürth, special attention will be paid to the fact that the methodology is transferable to other areas, at the same time,in order to ensure that it can also be applied in other cities.

CardiLink plans to disseminate the developed optimisation and imputation procedures both at the European level as well as in the USA or in selected Asian markets. This can reduce obstacles to the implementation of heart-safe city projects and ensure the increasing dissemination of monitored AEDs.

Following Restart a Heart Day: Workshop on the Integration of Practical Experiences
Following the kick-off of »HerzKISO« in May 2023, CardiLink and the Supply Chain Services Working Group will organise a joint workshop on 18 October. Associated partners - various stakeholders in the field of health assurance in the city of Fürth - will also be invited to this workshop in order to incorporate expert knowledge from the field. The two project partners will present first concepts and available databases and discuss the next iteration in the development of the algorithm.

For more information about the project:
www.scs.fraunhofer.de/de/referenzen/herzkiso.html
If you are interested in the project can contact us by e-mail at Lars.Wassermann@cardi-link.com for further information and to discuss the project with us.