Safeguarding the Future: Saving the Lives of At-Risk Newborns

NewbornTime project at the University of Stavanger uses MOBOTIX thermal technology and artificial intelligence

The University of Stavanger (UiS) is an international university with 12,500 students and 2,200 employees. The UiS is organized into six academic faculties and several national research and competence centers. Education and research are carried out at the Faculty of Health Sciences. One research project is the NewbornTime project, which deals with infant mortality.

If an infant receives too little oxygen during and after birth, this can lead to asphyxia and the death of the baby. A newborn who needs help breathing must be resuscitated as quickly as possible. In Norway, approximately 10% of term infants need stimulation and around 3% need bag-mask ventilation.

Challenge

The project partners – University of Stavanger (UiS), Stavanger University Hospital (SUS), Laerdal Medical, and bitUnitor – are working to automatically and instantly recognize a newborn as soon as it is born. What started with a portable thermal device has evolved into the NewBornTime concept. Birth asphyxia is responsible for approximately 1 million neonatal deaths each year. The findings from this study have the potential to transform newborn resuscitation, preventing not only deaths but also long-term complications. By identifying key risk factors and developing targeted interventions, the project aims to save countless lives and make a significant impact on reducing global infant mortality rates.

In the research project, a timeline is created that describes events and activities during a birth. The exact body temperature of the baby is not important. It is about the exact time of birth, which is to be determined automatically and in privacy, without attaching sensors to the mother or the baby. Manual determination of the periods is too imprecise. A video camera is a suitable sensor for this task.

Solution

The exact time of birth to the second is determined automatically with the help of MOBOTIX thermal videos from the delivery room. AI models based on deep neural networks are developed to to recognize birth events using thermal videos, and resuscitation activities from both thermal and visible light videos, converting them into AI-generated timelines. Based on the resulting timelines, guidelines can be followed and evaluated, thus enabling successful resuscitation measures.

Key Data

Vertical

Healthcare

Customer

University of Stavanger (UiS)
Stavanger University Hospital (SUS)
www.uis.no/newborntime

Partner

Bravida: Stavanger

Period

2022-2025

Solutions

12x Thermal Sensors
6x S16B Camera Modules

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> We informed the staff and parents how the system works and that the MOBOTIX thermal systems are GDPR-compliant. With their signature, the parents gave their permission to use the data from the MOBOTIX thermal sensors for the study. When a significant majority — over 80% — of mothers surveyed expressed excitement about joining the study, we knew right away — this is something special. We're proud to be on this journey together!
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James Nathan Miller,
Bravida Managing Director

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GDPR-compliant

Thermal cameras offer two advantages: they are GDPR-compliant and protect privacy as they do not show real images. They also reliably recognize the newborn, as the baby is warmer than the skin of the other people in the room at birth.

One MOBOTIX Thermal camera is used in each delivery room, mounted on the ceiling above the head of the bed. The research team uses the thermal images to generate data to train AI models. It is important to know when resuscitation measures take place concerning the time of birth and what happens during resuscitation.

Proven Reliability: Why MOBOTIX Is the Trusted Choice

MOBOTIX partner Bravida was already supplying MOBOTIX IoT and security solutions to Stavanger Hospital, when James Nathan Miller, Head of Fire & Security Department at Bravida reached out with a specific inquiry regarding the potential benefits of a system equipped with thermal sensors for this research project. That was possible thanks to MOBOTIX thermal radiometry technology with twenty temperature monitoring zones. In addition, the sensors could be integrated and optimized, so that they function in the best possible way.

The project team chose MOBOTIX because the parties involved were looking for top quality from Europe and had already been using MOBOTIX systems reliably for many years. The accuracy of the temperature readings from the sensors was also impressive.

Last but not least, the MOBOTIX IoT cameras could be integrated into the video management software (VMS), easily customized, send data to different file storage locations, and send alarms. There were no comparable systems in the same class that could have fulfilled this task so precisely.

The installation of the video systems on-site went smoothly. Occasionally, the delivery rooms were needed very spontaneously for births, so the installations only had to be interrupted for these happy events. The MOBOTIX IoT cameras offer GDPR compliance and a decen-tralized concept, ensuring the protection of personal data and increased security against data loss or unauthorized access during image transfer. This creates a safe environment for the mothers, with images securely stored and no optical image.

Conclusion: A milestone in improving infant care

This research project marks a significant milestone in advancing infant care. The team has developed what could be the first IoT solution for monitoring births, capturing data that has the potential to improve newborn resuscitation and ultimately save lives. The sensors, network, and servers supplied critical data for the study. Unlike many other companies that would have needed to outsource these system solutions, Bravida was able to deliver the entire expertise from a single source.

The research findings offer a clear roadmap for specific actions and plans that can make a tangible difference in the lives of newborns. Implementing these insights will foster a more secure and healthier environment for newborns, ultimately leading to a brighter future for the next generation.

Research & Findings

The project's protocol paper is open access, offering a valuable resource for deeper understanding and further details. The full study protocol, titled "Newborn Time - Improved Newborn Care Based on Video and Artificial Intelligence - Study Protocol", is published in BMC Digital Health. For continuous updates and detailed insights, the project's dedicated webpage provides an accessible and up-to-date source for the latest findings and developments as they become available.

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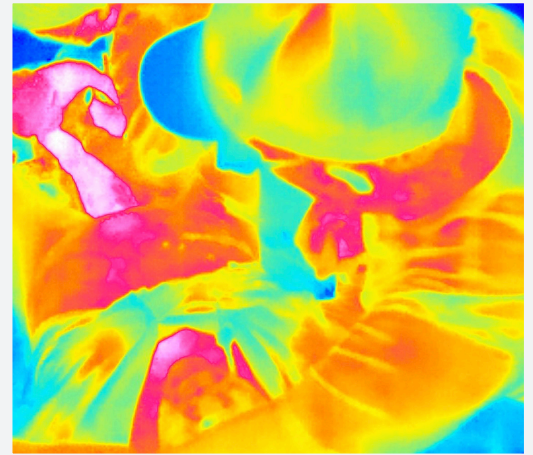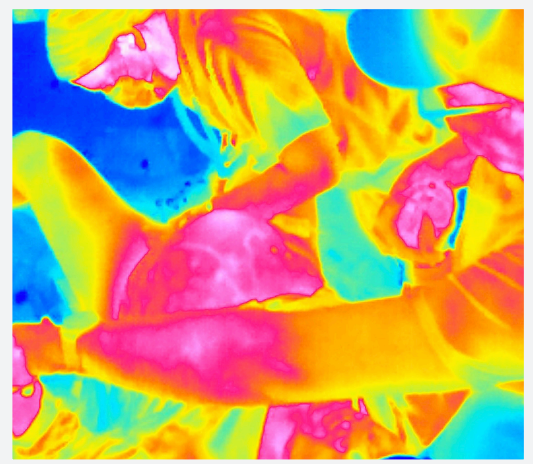
Curious? Scan the QR code and discover the video!

Note: The study mentioned in this video has concluded and is no longer active or enrolling participants. The content reflects information available at the time of recording.

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