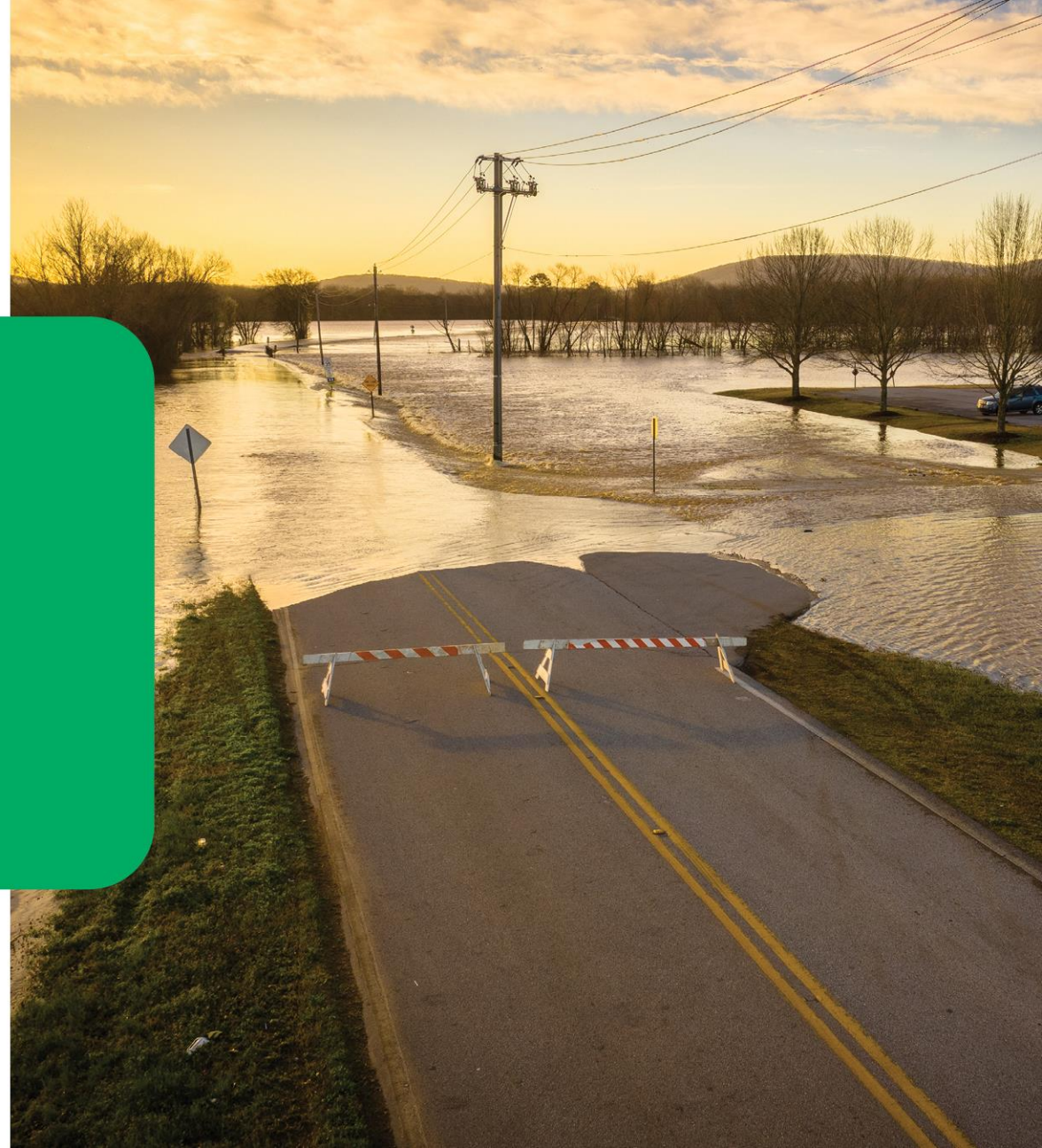




FLOOD

Ai Solutions for Flood Detection

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Introduction

In an era defined by the escalating impacts of climate change, the necessity for advanced technologies to address natural disasters like floods has never been more critical. Among these technologies, Ai-driven computer vision emerges as a powerful tool in flood detection, offering unparalleled advantages in early warning, accuracy, and scalability.

Traditionally, flood detection relied heavily on manual monitoring and limited sensor networks, often resulting in delayed responses and incomplete coverage. However, the integration of Ai and computer vision revolutionises this approach by enabling automated, real-time surveillance over vast geographical areas. Through the analysis of imagery computer vision algorithms can swiftly identify key indicators of flooding, such as rising water levels or changes in terrain morphology.



01



02



03

Ai Machine Learning

The significance of this technology lies not only in its ability to detect floods promptly but also in its capacity to do so with remarkable accuracy. Advanced machine learning models can discern subtle variations in imagery, distinguishing between ordinary water bodies and emergent floodwaters with precision.

Advantages

The scalability of Ai-driven computer vision renders it indispensable in monitoring large-scale flood events. From urban areas susceptible to flash floods to expansive river basins prone to seasonal inundation. These systems can adapt seamlessly to diverse environments, providing comprehensive coverage and facilitating timely interventions.

Future Thinking

The products and solutions from Neologic offer a strategic response to capitalise on the technological advancements of Ai and position your organisation at the forefront of innovation.



Ai Powered Solutions for Flood Detection

At Neologic, we harness the power of advanced computer vision to protect communities and assets from the devastating impacts of flooding. Our innovative flood detection systems utilise real-time image processing to monitor water levels and predict flood events with remarkable accuracy.

Dedicated to sustainability and safety, our technology empowers prompt and effective response measures, safeguarding lives and infrastructure against the unpredictable forces of nature.

About Us

As a trusted computer vision supplier, we work with industry leading manufacturers to provide a comprehensive range of products and services. We're driven by the belief that Ai and computer vision can be harnessed to enhance industries while adhering to ethical considerations.

About Our Vision

Our vision is to be at the forefront of this revolution by providing businesses with tools and expertise they need to integrate computer vision seamlessly into their operations.

30 +
APPS



The Challenge

The use of existing flood detection systems poses several challenges. Current real-time flood detection solutions such as tipping bucket rain gauges and radar water level sensors are difficult to install and require costly maintenance.

Comprehensive coverage

Selecting optimal sensor locations is essential, but it's a complex task. Achieving comprehensive coverage over a wide area demands meticulous planning, considering factors such as topography, hydrological patterns, and historical flood data.

Sensor Data

Flood detection systems generate large amounts of data from various sensors, which can pose challenges in collection, transmission, and real-time processing. Integrating these sensors seamlessly into emergency response systems is vital for timely updates and early warnings, but achieving this can be complex.

1

Densification of housing and changes in land use can modify hydrological patterns, elevating flood risk in cities. Addressing these dynamic changes necessitates ongoing monitoring and regular updates to flood detection models.

2

Urban areas present numerous waterlogging sites scattered across complex infrastructure, including roads, buildings, and underground utilities. Addressing these challenges with traditional sensors is costly and complex.

3

Urban flood detection requires combining data from various sources like weather forecasts, river gauges, sewers, and social media. However, integrating diverse data streams presents challenges in interoperability, synchronization, and accuracy, impacting the reliability of flood detection systems.

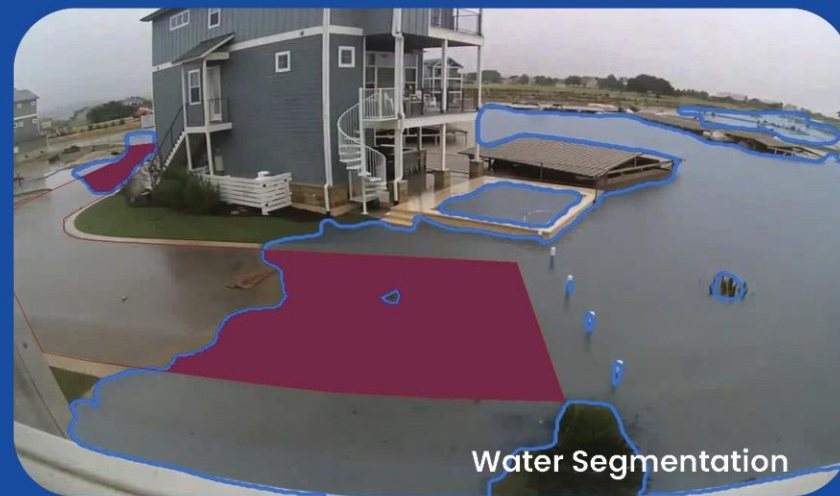
The Solution

Noelogic has partnered with NOEMA to deliver a complete turnkey solution for flood detection.

The solution integrates the functions of monitoring cameras, Ai algorithms, and communication devices into one complete package.

The computer vision application from Noema uses cutting edge digital ruler and water segmentation technology to deliver real-time insights and alarm notifications relating to water levels and floods.

The “plug & play”
video analysis solution
equipped with NVIDIA
GPU



Digital Ruler

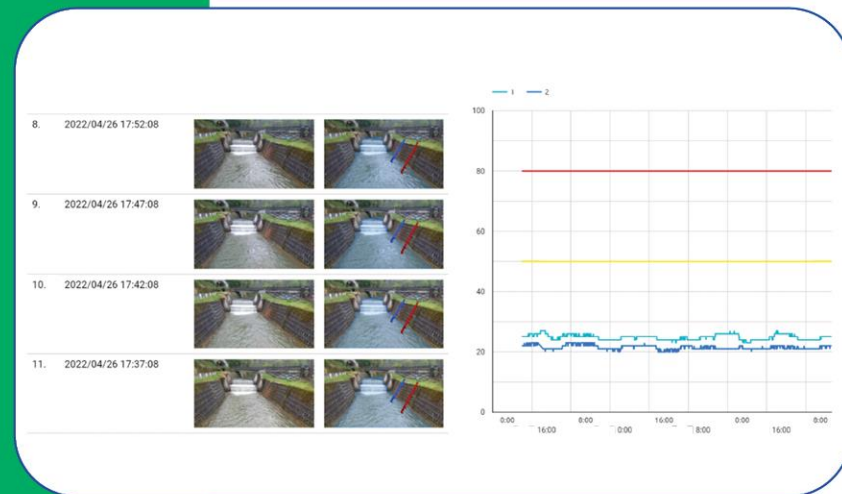
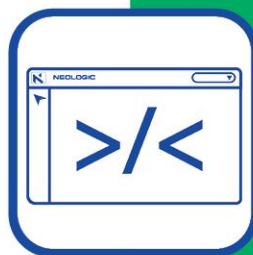
The computer vision application from Noema automatically detects water within an image sequence. Digital staff gauges or rulers are applied to the image for a contactless approach to measuring and monitoring levels of standing or moving water.

Data

The application generates easily digestible meta-data that can be sent to a flood monitoring system where water levels are recorded and tracked in real-time. The generated data can be separated out to the original, or augmented frame with a timestamp of the event and information related to water level.

Notifications

Alarm thresholds can be set for each virtual ruler and these events can be sent in real-time to an intended recipient such as an Operation Control Centre. A camera image can be attached to these alerts.



Water Segmentation

In addition to the digital rulers the application can be configured to cover a predefined area which it will monitor for water coverage. When the water reaches a custom defined threshold then an alarm event is triggered.

It is possible to use both elements of the computer vision technology at the same time. For example a river water level can be monitored via digital rulers whilst monitoring areas around the body of water for flooding from other sources.

The application can be configured remotely making installation and adjustments to the flood detection system simple and extremely cost effective.



Architecture

A contactless measuring tool

An existing or new camera is installed in the desired location as an optical sensor, providing data for the Ai application to process. The flood detection solution is not submerged and therefore the system is protected from floating debris.

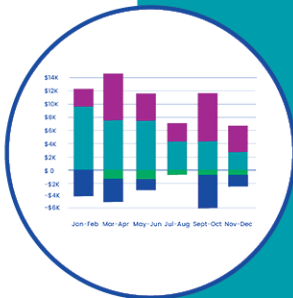
Simple & Intuitive to configure

The application can be configured remotely making installation and adjustments to the flood detection system simple and extremely cost effective.

There is no limit to the number and size of the virtual rulers or alarm zones, and they can be applied to any body of water or area that might not even have water flowing over it such as a road or tunnel.

Remove Doubt

The Smart Camera sensor has the advantage of operating from images. These images are useful for assessing and validating a hydrological event and it allows users to rapidly validate and monitor the pertinence of the data produced.



Early Warning

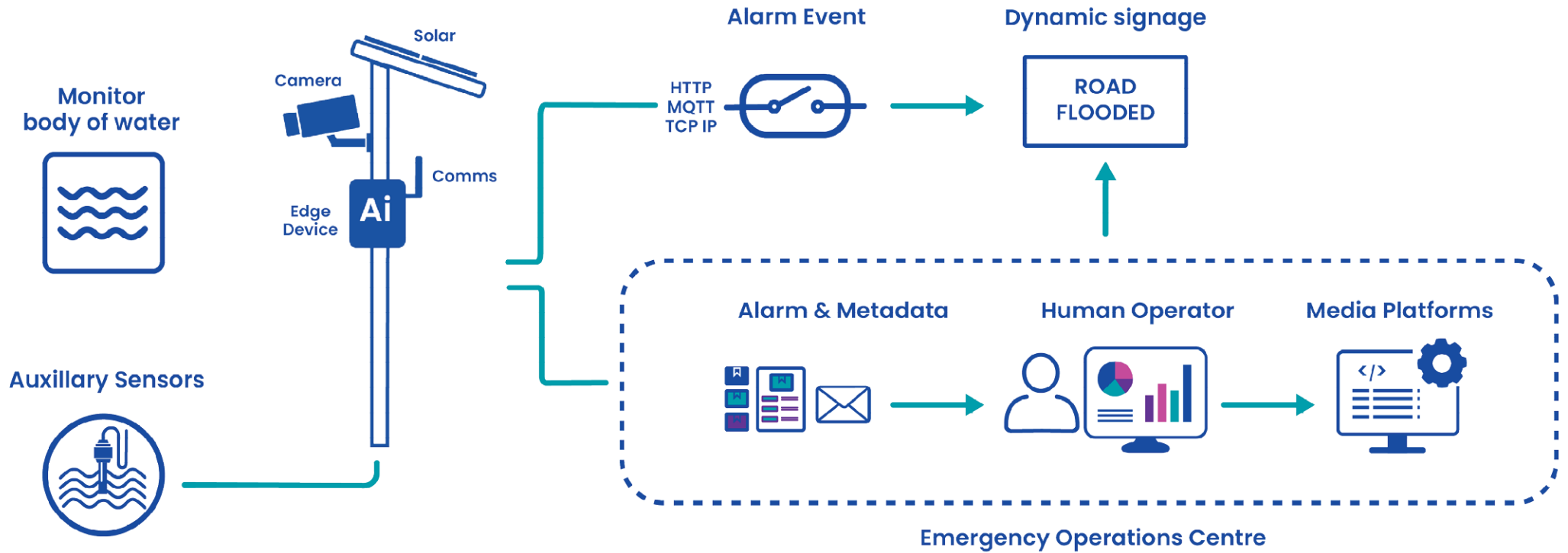
Operating 24/7 the Ai computer vision application provides real-time monitoring of vast areas and automates the process of flood detection, eliminating the need for manual monitoring.

Cutting edge Ai Devices

The Ai hardware transforms existing cameras, enhancing their function through Ai technology and deep learning models. It comes preloaded with the computer vision application. Multiple applications can be loaded onto the appliance and used simultaneously.

Software

Analysing the gathered flood data provides valuable insights for improving flood risk management strategies, urban planning and infrastructure development.



Edge Side Analysis

Computer Vision applications are installed and run directly on board an industrial Ai device.

This reduces the network load and only events of interest are sent to external systems.

Cameras installed around the city



Monitored body of water



Stream with (RTSP)



Video Analytics Server



Alarms & Metadata



VMS



Alarms with recorded video

Control Room



Dashboard



Alarms & Events

Alarms & Metadata



Media Platforms



Dynamic signage



Server Side Analysis

Analysis of the video stream is undertaken by the computer vision application running onboard a server.

With greater processing power, servers provide the ability to analyse multiple video stream simultaneously and at higher frame rates.

Advantages

Overall, the advantages of using computer vision for flood detection lie in its capacity to offer prompt, precise, and expandable monitoring options.

Real-time Monitoring

Operating 24/7 the Ai computer vision system continuously monitors vast areas in real-time and automates the process of detecting floods as they occur.

Easy to install

The solution offers edge and server-side analysis, enabling easy remote deployment and configuration without on-site work. Installation can be done by any approved CCTV contractor.

Remove doubt

Visual verification remotely resolves doubts about water level measurements and exceeding alarm thresholds, eliminating the need to send teams to remote sites. It also allows verification of measurements from traditional water sensors.



Scalable

The Flood detection system can be deployed in remote inaccessible areas or in urban environments where traditional sensors are impractical and flash floods happen with limited warning.

With options to use either edge or server side Ai analysis the system can easily be scaled to cover large geographical areas, especially if optical sensors from the surveillance network are utilised.

Accuracy

Advanced computer vision algorithms can accurately identify flood-related features such as water bodies, submerged objects, or changes in terrain morphology, minimizing false alarms and ensuring reliable detection.

Cost effective

Although there are initial setup costs, the system proves more cost-effective in the long term than traditional monitoring methods. It offers task automation, remote configuration, and utilises existing surveillance infrastructure, reducing the need for extensive human resources.

Scaling Solutions

At the forefront of technological innovation, we specialise in delivering our partners cutting-edge computer vision applications. These applications can be seamlessly integrated into existing surveillance networks, enabling rapid scaling without compromising efficacy.

Combining these applications with powerful edge computing devices enables us to provide adaptable solutions that can be applied to diverse fields ranging from public safety and environmental monitoring to optimising traffic flow in smart cities.

Whether using edge or server side analysis multiple applications can be used in concurrence across the surveillance network further enhancing scalability.

APPLICATIONS

35 +

With over 35 ready to deploy applications and with options to have custom applications developed, we provide solutions that span a wide spectrum of industries.

Custom Made Applications



Snow Detection



Smart City



Traffic Violation



Fire & Smoke Detection



Our Partners

At Neologic we are passionate about the limitless possibilities of computer vision. We actively foster partnerships with Ai experts, technology developers, and industry leaders to ensure that our solutions are cutting-edge, responsible, and aligned with the latest developments in Ai and computer vision.

A.I. Tech

With 30+ years of experience in the field of Ai, the products of A.I.Tech are developed using the most advanced technologies.

Noema

With a focus on creating highly ethical Computer Vision solutions Noema's expertise lie in being able to port complex algorithms to the edge.



A.I. Tech
The Vision of the future. Now.




noema



noema

At the forefront of technological innovation, Noema specialise in delivering cutting-edge computer vision applications that are unique and set them apart from competing products.

Noema's solutions encompass a wide spectrum of industries, with a focus on creating functional applications that unlock insights to drive progress and transformation.

13 +
APPS

NOEMA

NOEMA expertise lie in creating bespoke

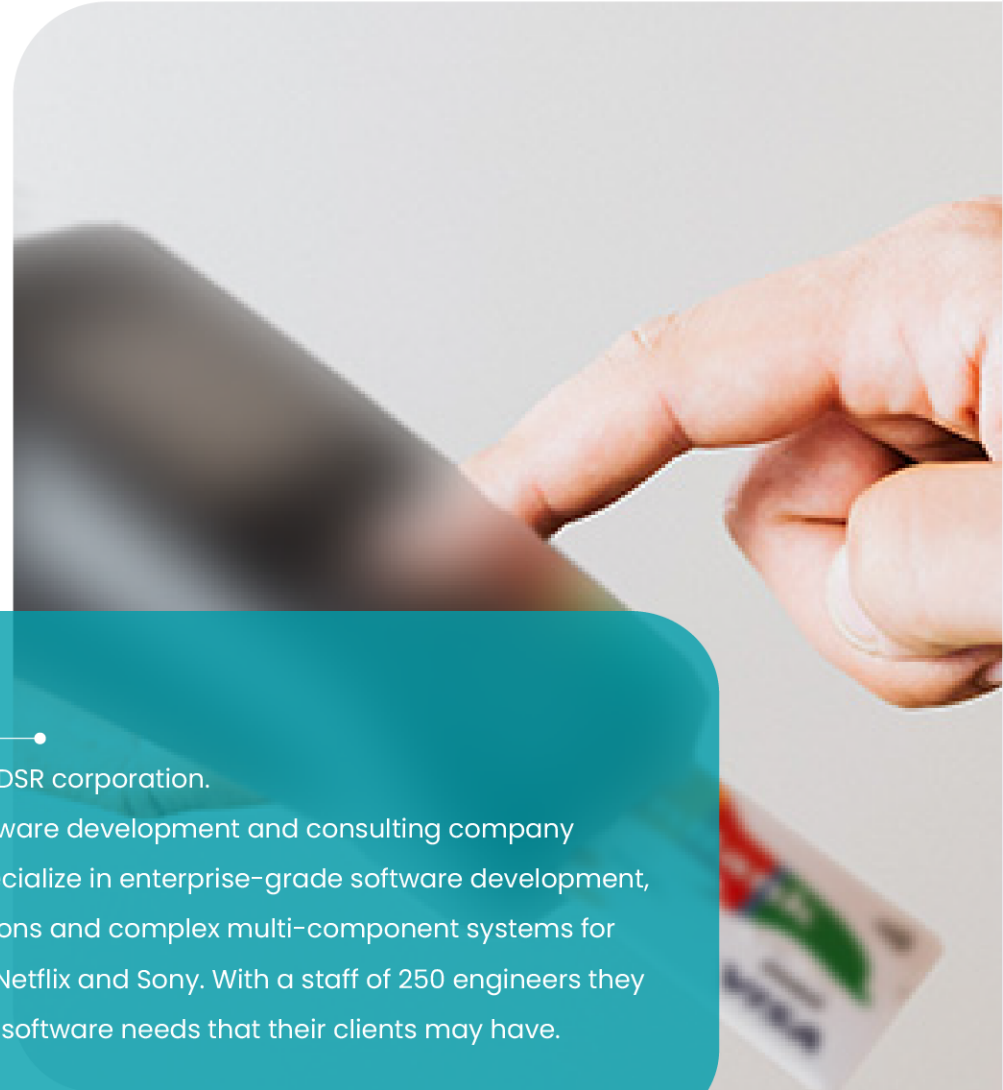
Computer Vision applications, specialising in:

- Data Model Design & Optimisation
- Algorithm Development
- Solution Architecture
- Product Development Support
- Solution Implementation & Support

DSR

NOEMA is a subsidiary of DSR corporation.

DSR is a professional software development and consulting company based in the US. They specialize in enterprise-grade software development, mission-critical applications and complex multi-component systems for clients such as Seagate, Netflix and Sony. With a staff of 250 engineers they support **NOEMA** with any software needs that their clients may have.



Case Study

Noema and eTrust, a Japanese company specialising in environmental monitoring and disaster relief, recently collaborated to develop a river monitoring system that would be used throughout Japan.

The following are extracts from the business partnership agreement between NOEMA and etrust 06/03/24



Photo of Flood Detection in use in Japan

Background Development

In recent years, torrential rains and typhoons becomes larger. Therefore, there is an urgent need to take measures to prevent floods that may cause devastating damages across the country. eTrust participated in the “Innovative River Technology Project” led by the Ministry of Land, Infrastructure, Transport and Tourism, and we have successfully delivered simple river surveillance cameras to many local development bureaus and local government.

Detail of Development

To improve functionality of river surveillance cameras, we made a business partnership with Noema. Noema has extensive knowledge and experience in the Ai field. Through this partnership, we will work together to develop efficient and highly accurate river monitoring cameras that incorporate Ai based water level detection functions. In the future we will expand the scope of monitoring not only to rivers but also to road flooding and snowfall, mountain environmental monitoring, and countermeasures against wildlife

Synopsis

Neologic is a technology partner providing cutting edge Ai computer vision solutions for Flood detection. In collaboration with our channel partners, we can provide a complete solution that comprises of optical sensors, flood detection algorithms, Ai hardware and communication equipment.

The Ai flood detection system alerts authorities and communities to impending floods in advance, enabling them to take preventative action like deploying emergency response teams or dynamically altering transportation routes through signage.

Get in Touch

We invite you to discuss this information pack in detail and explore how we can tailor our services to meet your specific needs.

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