

Real time drowsiness detection, Alerting and reporting (RESONATE)

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LIBRA at a glance

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Who we are

We are a boutique Data Science Agency offering customized Machine Learning and AI business intelligence services and solutions.

Our vision

We aim to bring advanced Machine Learning and Artificial intelligence into real-life applications.

Our principals

We rely upon these core values to build our company's culture, promote excellence and innovation and constantly evolve:

DIVERSITY • KNOWLEDGE • INGENUITY • EXECUTION • QUALITY • ACCESSIBILITY

Libra's Activities

Full-stack data science services

- Data strategy consultancy and AI-optimized data warehousing
- Visual analytics & Business Intelligence
- ML / AI in real-life applications



Dig_IT - AI-enabled Decision Support & Business Intelligence System for the Mining Industry

A Human-centred Internet of Things Platform for the Sustainable Digital Mine of the Future



PRELUDE - Measurement and Verification of Smart Proactive Buildings

Prescient building Operation utilizing Real Time data for Energy Dynamic Optimization



EIFFEL- GEOS applications for Climate Change adaption and Mitigation

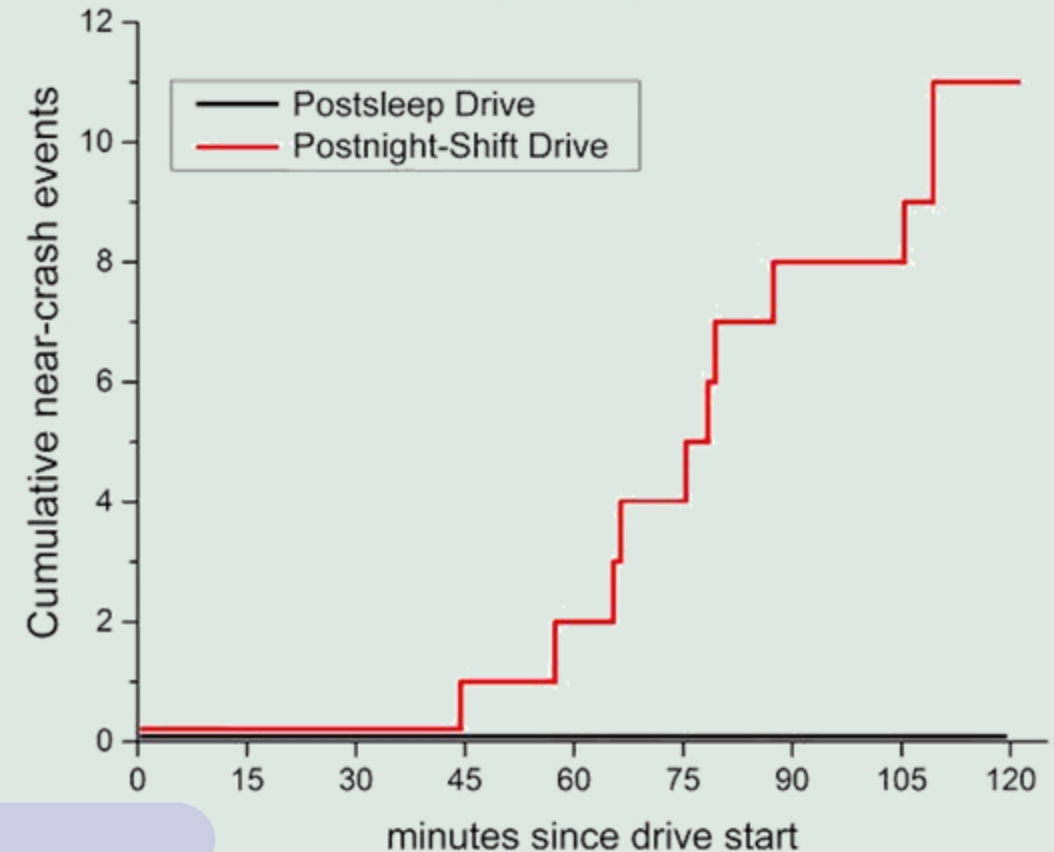
Revealing the role of GEOS as the default digital portal for building climate change adaptation & mitigation applications

Drowsiness in working environment

- Shift workers, 15% of the workforce, are at particular risk of drowsiness during vehicle operation
- Employees with drowsiness are 70% more likely to be involved in work-related accidents
- Around 60.5% of crane operators continue to work even while having signs of drowsiness or fatigue.

Build a solution to fight drowsiness related accidents

Near-crash Events



M. L. Lee *et al.*, "High risk of near-crash driving events following night-shift work," *Proc Natl Acad*

RESONATE overview

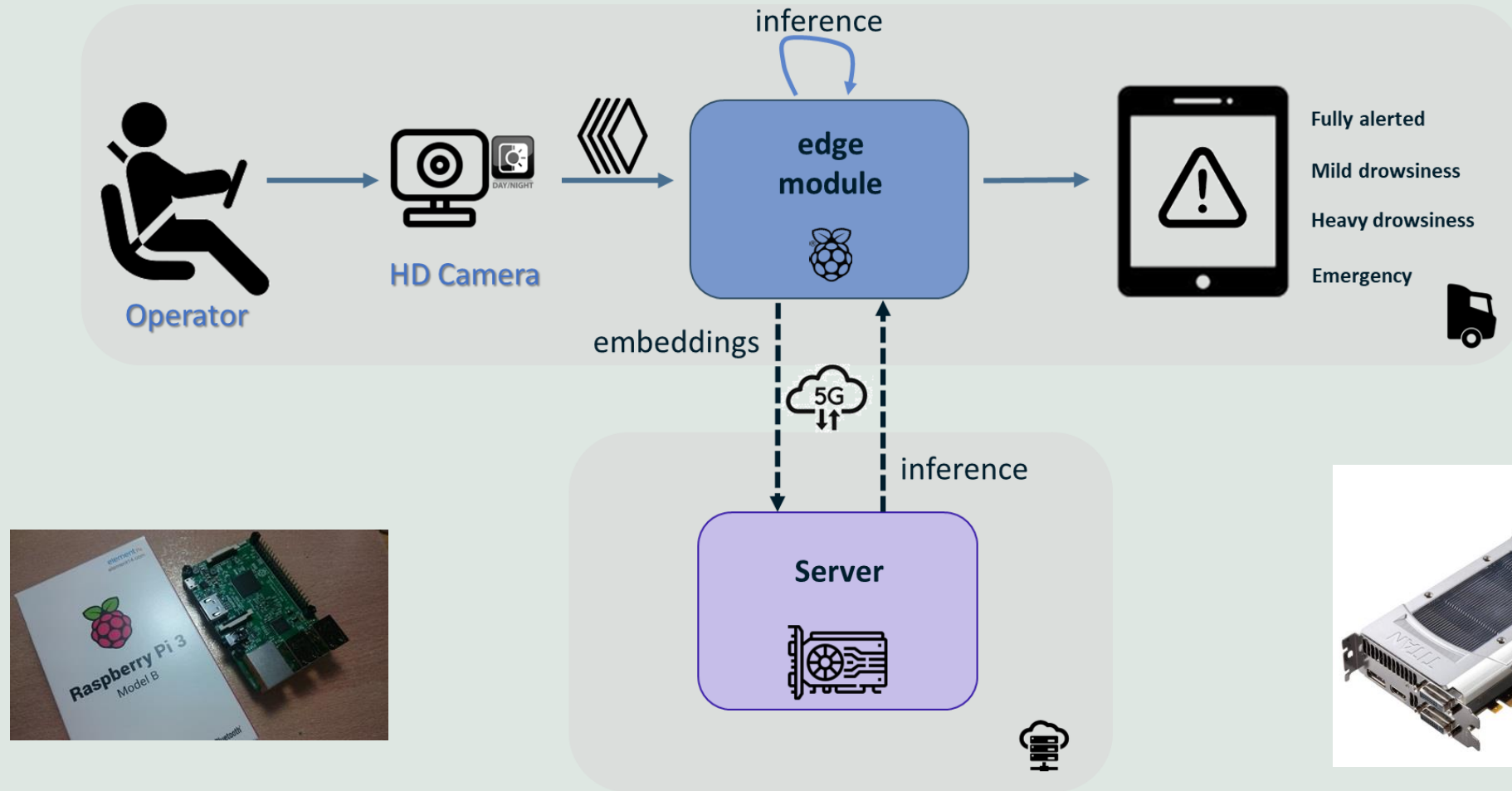
Concept:

- Video-based solution for recognizing drowsiness of heavy machinery operators
- Non-invasive methodology
- Monitor the operator's condition in real-time identifying the level of drowsiness
- Trigger an alert (e.g., by sounding an alarm, installed in the heavy machine cabin) avoid potential accidents
- Gather the data to drive future decisions on a heavy machinery fleet shifts

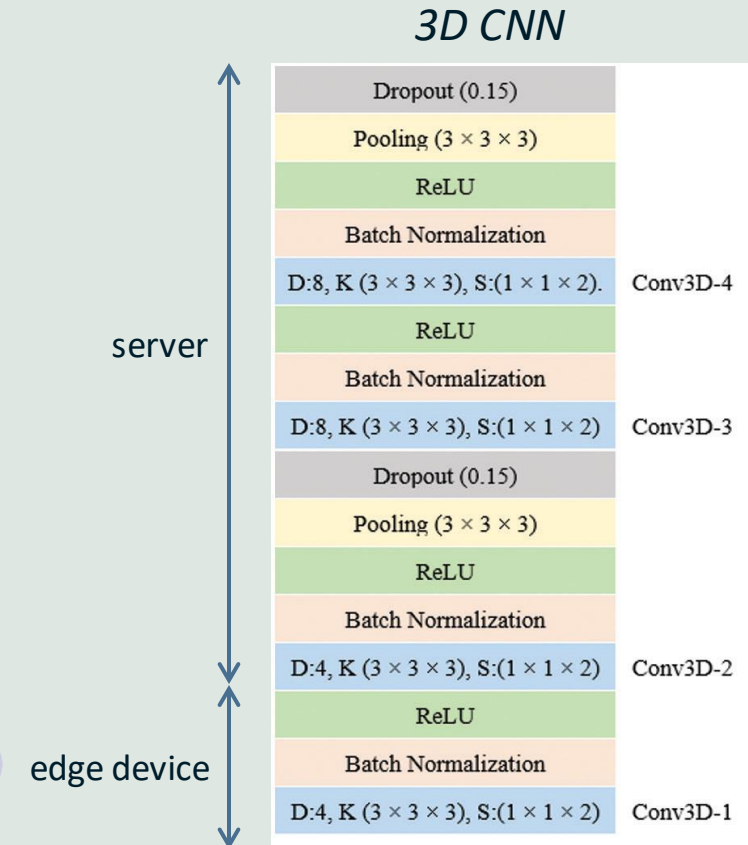
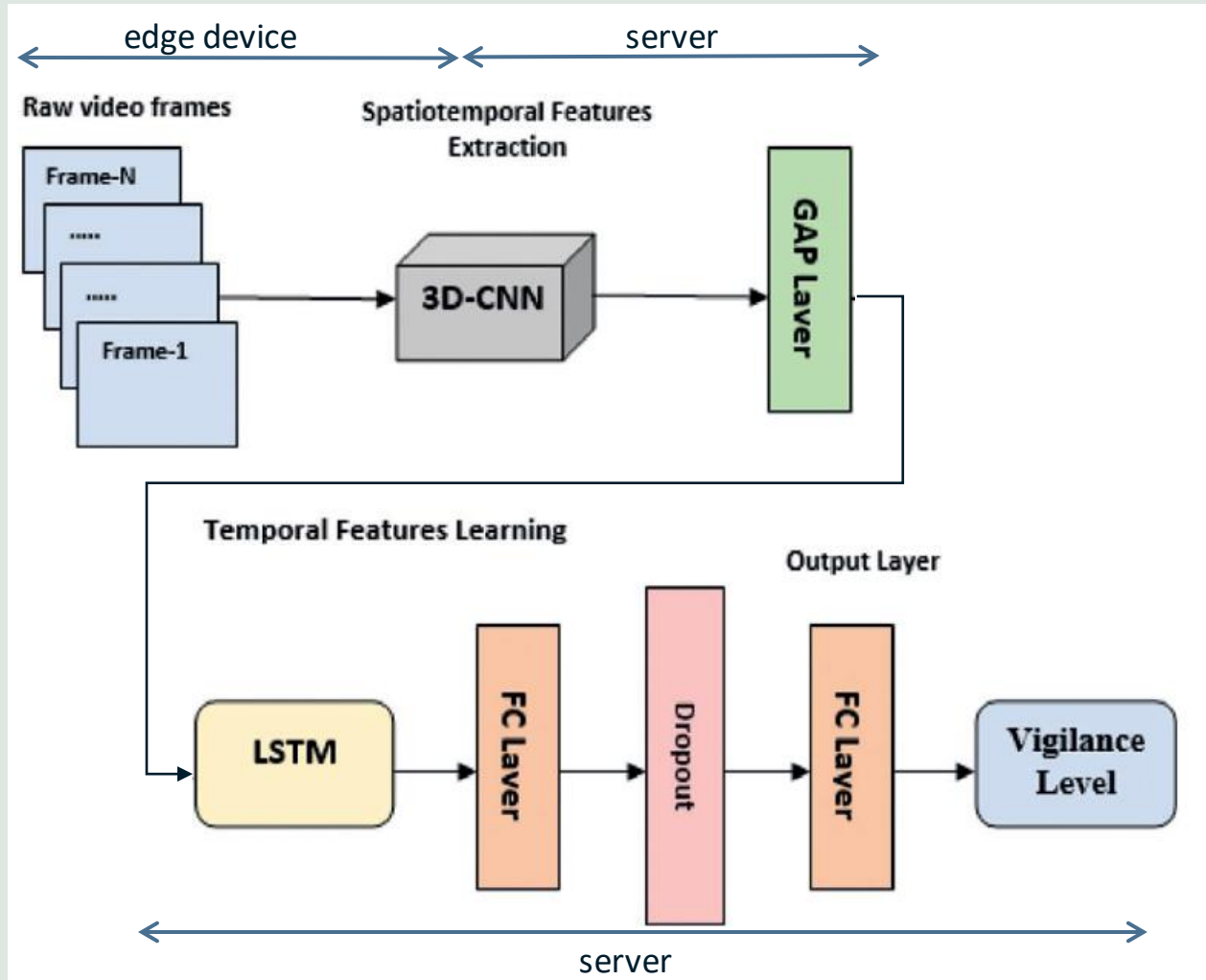
Features:

- Hybrid exploiting rpis and gpu server computational resources
- Relatively low-cost solution with less powerful edge devices and powerful server over 5G (low latency)
- Decision Support system to monitor drowsiness of the fleet
- GDPR compliant solution considering operators privacy

RESONATE architecture

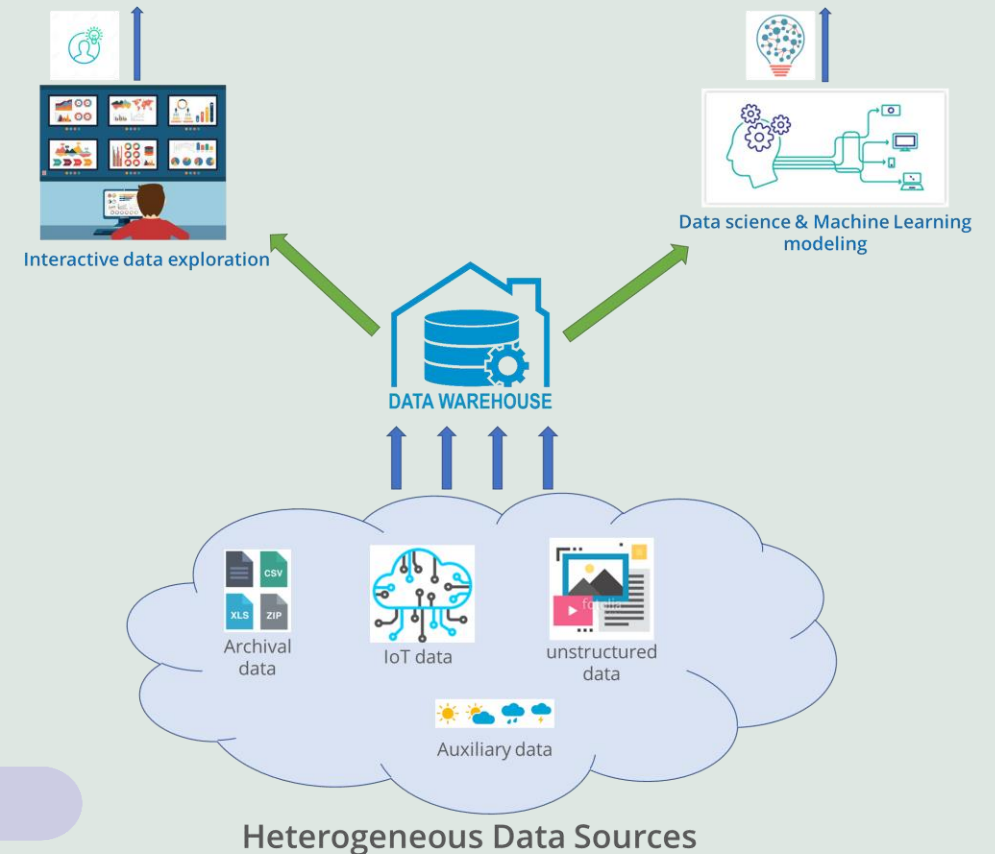


ML architecture



RESONATE decision support system

- Central data repository and reporting infrastructure
- Data warehouse with a pool of heterogeneous data sources enabling
 - Interactive data exploration capability for human experts
 - 360o view of the fleet alertness performance
 - Draw Insights that drives & supports safety decisions
 - Real time monitoring
 - Derive and track KPIs
 - High performing Machine Learning to benefit the organization



RESONATE Demo



- 4th among the busiest European Ports of 2020 in terms of container
- Moving about 5.5 million TEUs on an annual basis.
- a mother vessel requires an average of 3000 stevedore moves for operation completion, e.g., for loading/unloading all containers



port's heavy machinery, e.g., truck drivers or crane operators

3x Trucks

Phase 1. Video recording for training in different condition

Phase 2. Monitoring and alerting in real time

Key personnel involved



Yannis Kopsinis, PhD
CEO and Co-Founder



Athanasios Balomenos, PhD
CTO and Co-Founder



Christos Petrou, MSc
Senior Data Scientist



Zisis Flokas, MSc
*Software and DEVOPS
engineer*



Dimitris Xynogalas
Junior ML Engineer



THANK YOU!
Any questions?