EuroHPC JU Information Day for AI on Supercomputers FF4EuroHPC

CardioHPC

Improving DL-based Arrhythmia Classification Algorithm and Simulation of Real-Time Heart Monitoring of Thousands of Patients

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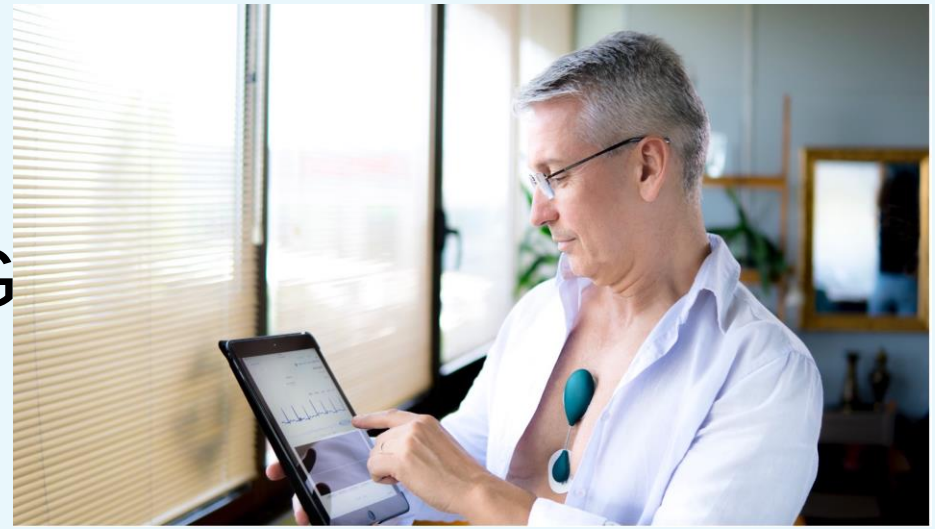
Outline

- Business Challenge
- The solution and HPC approach
- Results
- Business impact
- Lessons learnt

Objectives

1) A real-time remote **heart monitoring** center (<3 sec response processing 10K patients)
2) A **large-scale demonstration** processing 10K simultaneous ECG
3) **Improve** the existing **DL solution**



Challenge

1) Online software **ViewECG with CE mark** as a medical device needs improvement of self-diagnostic AI-based services
2) **Training** DL-based algorithms
3) Results must be accurate and fast

The solution

Develop an **improved ML/DL algorithm** with extensive ECG benchmark databases trained on thousands of GPU cores

Main outcomes

- **Reduced costs and time** to design a solution and conduct simulation experiments.
- Developing **new features and increased performance**.
- Updating the **business strategies and exploitation plan** with new business opportunities.
- **Reduced costs** for delivering a service for thousands of patients simultaneously.

Expected business impact

- **Ready-to-market service** for increased workloads, which was not technologically and economically feasible before,
- Improvement in arrhythmia detection and classification by **reducing the error rate by 50%** (from 20% to 10%)
- **Double revenue** by adding a new product to SME portfolio of services.
- **25% increase of efficiency and profit**, due to reduced costs

Expected societal impact

- creating new jobs (doctors, salespersons, distributors, medical assistance, technical support, customer support, Internet and cloud providers, etc.)
- improving overall healthcare

Expected environment impact

- No direct impact on the environment
- Energy requirements may pollute the environment for production of electrical energy
- Reducing the the transportation needs (patients will be remotely monitored)

Lessons learned

Thank you

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