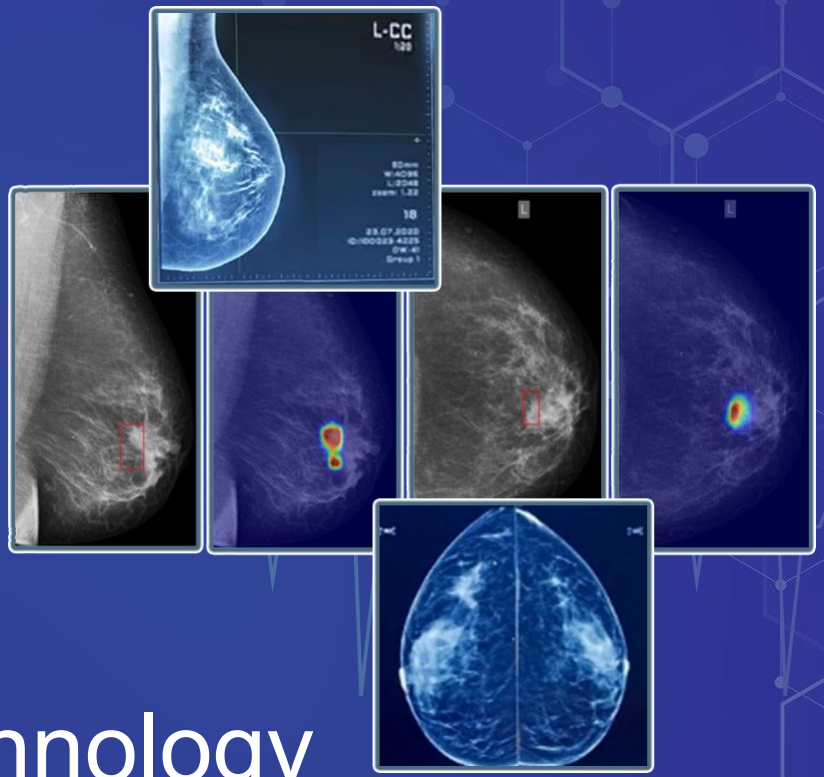
QuData



Computer-Aided Technology for Early Breast Cancer Detection

Current Problems

Breast Cancer: A Global Concern

- Breast cancer ranks among the most prevalent forms of cancer.
- Millions of women are affected annually.

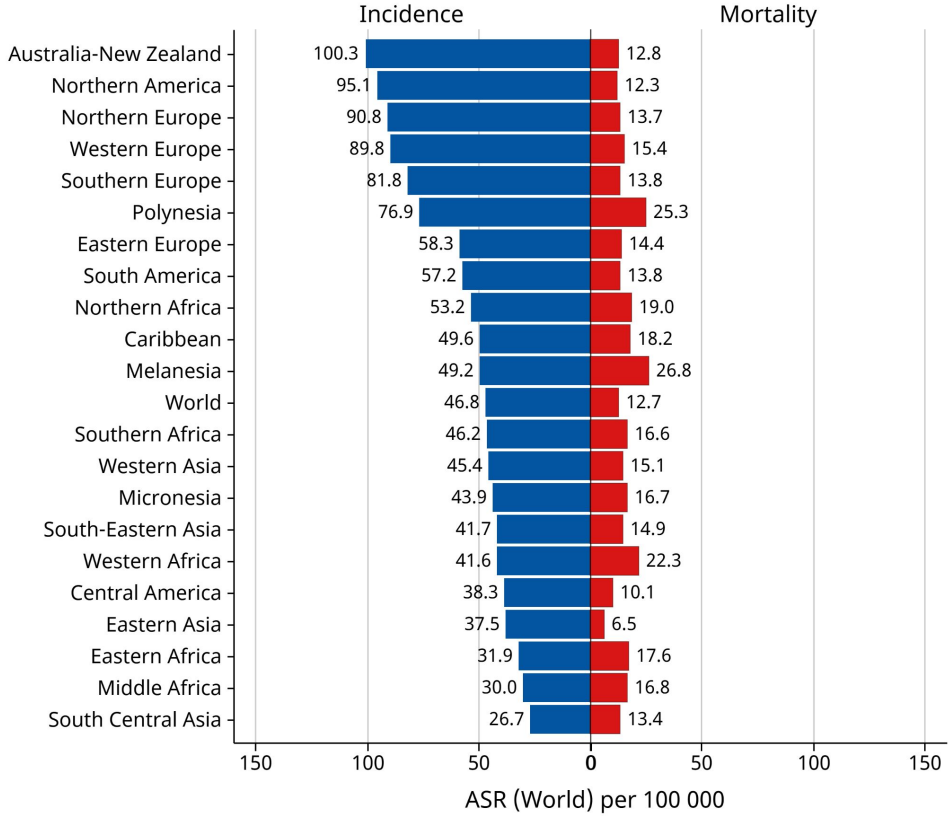
Existing Diagnosis Challenges

- Subjective human interpretation.
- Inconsistencies and missed diagnoses.
- Strain on healthcare systems due to increasing screenings and severe shortage of radiologists.

Global Disparities in Data and Care Access

- Medical data distribution imbalance.
- Unequal access to optimal care due to the lack of the resources and infrastructure.

Breast Cancer Worldwide Overview



*Age standardized (World) incidence and mortality rates of the breast cancer in 2022

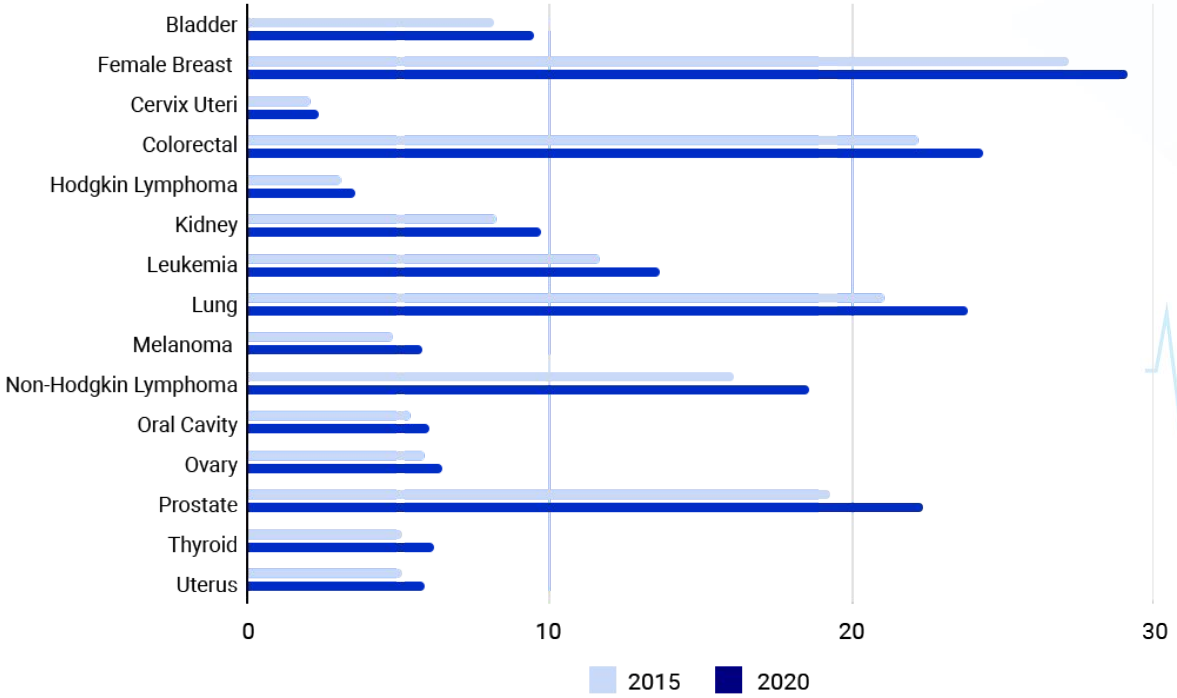
There were more than 2.29 million new breast cancer cases in women in 2022.

The world age-standardized rate (ASR) for breast cancer is approximately 46.8 cases per 100,000 population.

There is a substantial variation in breast cancer incidence rates across different regions. This variation is greatly attributed to underdiagnosis in certain areas, particularly in Africa and Asia.

In regions with underdiagnosis, breast cancer is often detected in later stages, which can lead to higher mortality rates.

Cancer Treatment Cost



Breast cancer has the highest treatment cost of any cancer.

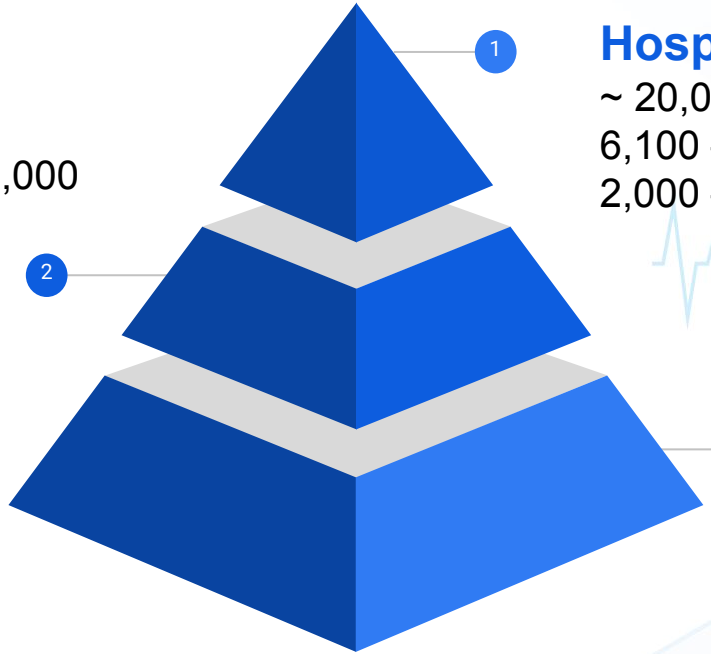
In 2020 only in the USA, the total annual medical cost of breast cancer care was 29.8 billion dollars. It has increased by approximately 11% from 2015 to 2020.

Market Needs

Here are just a few key figures representing the potential user base for the Qudata's Solution – **Breast Cancer Computer-Aided Detection system**.

Radiologists

~ 12.8 radiologists per 100,000 population in the EU,
8.8 in the USA,
and only 1 in Ukraine and India



Hospitals

~ 20,000 hospitals in the EU,
6,100 – in the USA, and
2,000 – in Ukraine

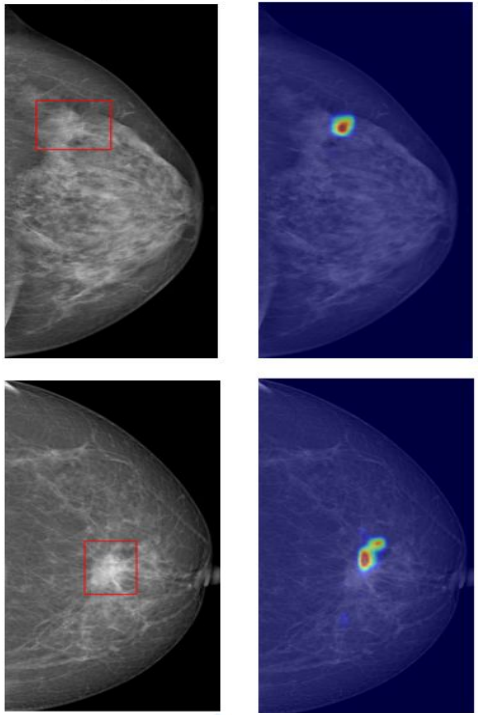
Students

More than 400,000 medical graduates worldwide

Breast Cancer Computer-Aided Detection

The Qudata team has developed an AI-powered system that seamlessly integrates deep learning algorithms with advanced image analysis. This innovative solution is meticulously designed to simplify the diagnostic process, reduce subjectivity, and expedite precise interpretations.

By leveraging advanced technologies, our system transforms mammograms into comprehensive data representations that enable rapid and precise analysis. The AI-driven tool categorizes findings based on approved classifications, providing medical practitioners with consistent and standardized insights.



Potential Solutions

- **Standardized Screening Protocols** can be adopted globally to ensure consistent and reliable diagnoses.
- **AI-Powered Early Detection** for enhancing accuracy and consistency in diagnosing breast cancer at an early stage.
- **Collaborative Research** to address the disparities in breast cancer diagnosis and treatment outcomes across regions.
- **Data Sharing Initiatives** among healthcare institutions and countries to address data distribution imbalances.
- **Continuous Training** for healthcare professionals and medical students.

How it works

1. Mammography is done in clinics or hospital x-ray departments.

2. Each mammogram image automatically is put through the AI system.

3. BI-RADS (Breast Imaging-Reporting and Data System) classification is assigned by AI system for each mammogram view.

4. Lesion areas (if exists) are marked by bounding boxes.

Key Features

Enhanced Diagnostic Accuracy:

- Offers unparalleled precision in breast cancer detection.
- Reduces the likelihood of missed diagnoses and false positives.

Early Detection and Intervention:

- Identifies breast cancer at its earliest stages, leading to more effective treatments.
- Increases the chances of full recovery and improved patient outcomes.

Second Expert Opinion:

- Provides a reliable second expert opinion for medical practitioners.
- Lays out additional insights and confirmation in complex or challenging cases.

Comprehensive Educational Platform:

- Empowers medical students and professionals to enhance their diagnostic skills.
- Offers a learning environment with access to real-world medical cases and expert guidance.

Cost-Efficiency:

- Minimizes unnecessary medical procedures and treatments.
- Reduces healthcare costs associated with diagnostic testing.

Advanced Technology

Neural network architecture: our BI-RADS classification system utilizes a state-of-the-art neural network architecture which combines convolutional neural networks (CNNs) and advanced deep learning techniques to analyze medical images.

Consistent performance across clinical environments: model performs consistently across diverse clinical environments, and its predictions are not affected by minor variations like which machine the mammogram was taken on.

Lesion areas detection: class activation maps are used to detect various abnormalities such as calcifications, mass, and other critical indicators for accurate diagnosis and classification.

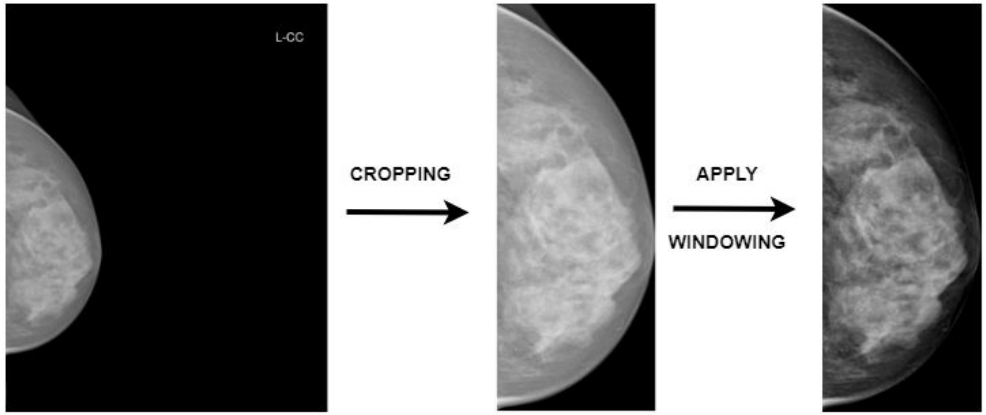
Limitless scalability: a scalable architecture allows for expanding external requests without limitations on the number of requests from users.

Technical Details

The windowing technique is used to enhance the image contrast and brightness.

The neural network is employed to precisely identify and isolate the pertinent region of the breast from the original scans.

The heat maps technique is applied to mark and pinpoint the areas of interest in mammograms.



Our Achievements & Metrics

QuData's technology for early breast cancer detection transforms mammograms into precise, standardized data, delivering rapid, consistent analysis. Our approach addresses the lack of methods capable of categorizing mammograms into multiple outputs.

Breast Cancer Computer-Aided Detection system is already making a meaningful impact in the field of healthcare. In collaboration with a local medical diagnostic clinic in Ukraine we have successfully integrated the pilot model into a clinical setting.

- ✓ Trained on the mammography dataset of **20,000 scans**
- ✓ Reached **80% accuracy** level when evaluating BI-RADS and Density classification
- ✓ Built using the **ConvNeXt** architecture
- ✓ Applied Grad-CAM technique for **tumor localization**

Future Developments

Improving Model Evaluation

Continuously refining our model evaluation processes and introducing upgraded metrics and techniques to ensure top-tier accuracy and efficiency.

Venturing into New Markets

Extending our influence by expanding into new regions and healthcare markets, collaborating with healthcare providers and organizations around the world for wider accessibility.

Expanding the Dataset

Creating a holistic view of real-world breast cancer cases, including anonymized patient histories from covering initial screenings and biopsy results up to expert diagnoses.

Exploring New Realms

Utilizing our AI expertise to broaden its application to various healthcare and radiology domains, starting with a particular focus on early diagnosis and enhanced outcomes in lung cancer care.

Business Plan: Subscription Model

Affordable Price

The subscription cost is set at an affordable rate, allowing a wide range of countries, institutions, professionals and students to benefit from our AI-powered system.

Cost-Effective Asset

The subscription model is designed to provide significant cost savings for healthcare institutions within a short timeframe.

Renewal Flexibility

Subscriptions can be renewed or adjusted based on the users changing needs, ensuring an ongoing, mutually beneficial partnership.

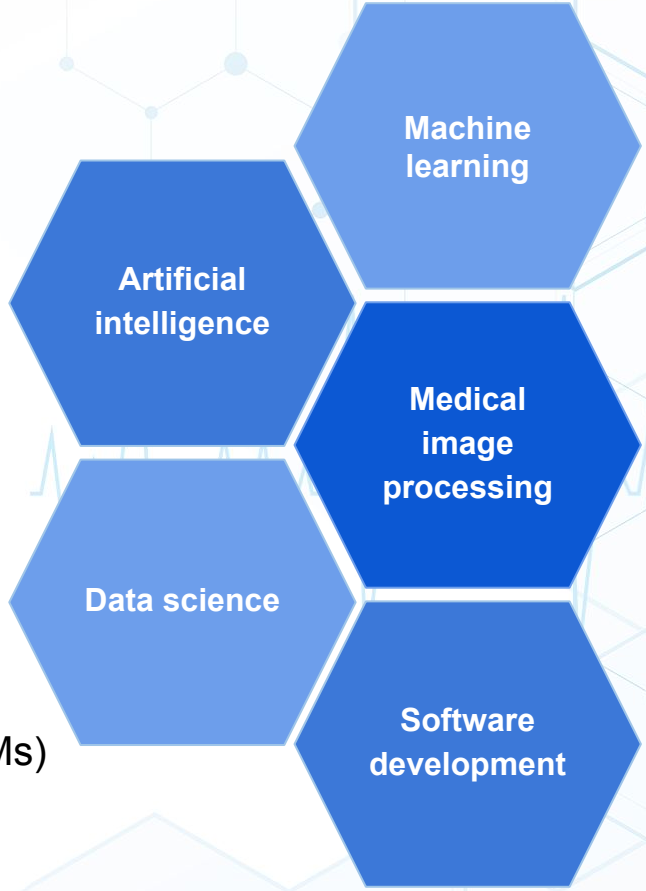
QuData Team

Foundation: QuData is a dynamic startup founded in 2018, specializing in solving complex machine learning and artificial intelligence challenges.

Diverse Expertise: QuData team has successfully carried out a number of projects in the field of medical diagnostics, large language models and processing of multidimensional sensory data.

Extensive Capabilities:

- ✓ PyTorch
- ✓ OpenCV
- ✓ TensorFlow
- ✓ Deep neural networks
- ✓ Reinforcement learning
- ✓ Transformers
- ✓ Large language models (LLMs)



Recent Medical-Related Projects

AI-AIDED ANALYSIS OF RETINAL FLUORESCENT BIOMARKER

In collaboration with Novai, a British biotechnology start-up, our engineers applied machine learning and image-related diagnostic techniques in clinical ophthalmology. Together we focused on detecting disease activity in the retina at a cellular level using low-resolution images.

CERVICAL SPINE FRACTURE DETECTION

QuData team has developed a system designed to detect cervical spine fractures from CT scans. By meticulously analyzing bone structure and density, our solution accurately pinpoints fracture sites, enabling doctors to make prompt diagnoses and prevent complications.

NOVOZYMES ENZYME STABILITY PREDICTION

Our team has developed an advanced machine learning model to predict enzyme thermostability. It was trained on diverse enzyme variants and offers a powerful tool for accelerating biotechnological advancements and addressing global challenges in sustainability.

Contacts

+13323318652

https://qudata.com

info@qudata.com

53 Voznesenska St,
Dnipro, Ukraine, 49000

https://www.youtube.com/@Qudata

https://www.linkedin.com/company/qudata-ai/

+380674420588