

Early screening for breast cancer

What if we could detect breast cancer earlier - when it is still difficult to see?



Breast Cancer: 2022

The Numbers

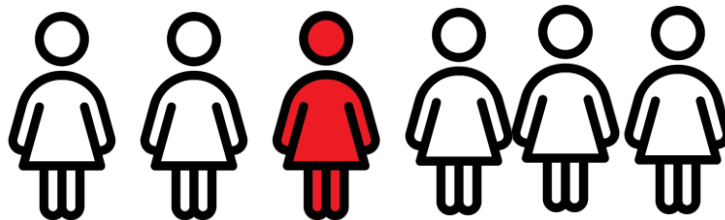
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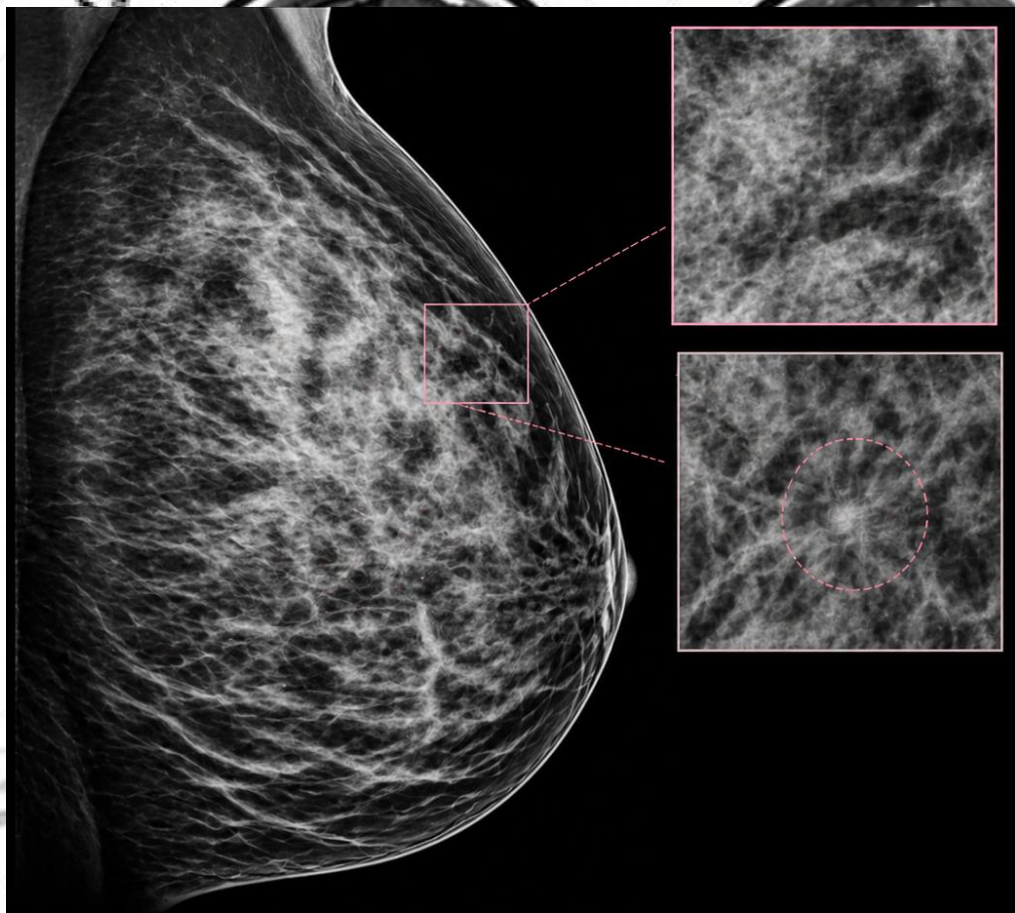
1 in 11 women in the EU-27 will develop breast cancer before the age of 74.

Breast cancer is the most commonly diagnosed cancer in women.



Breast cancer is the leading cause of cancer death in women **worldwide** accounting for 1 in 6 cancer deaths.





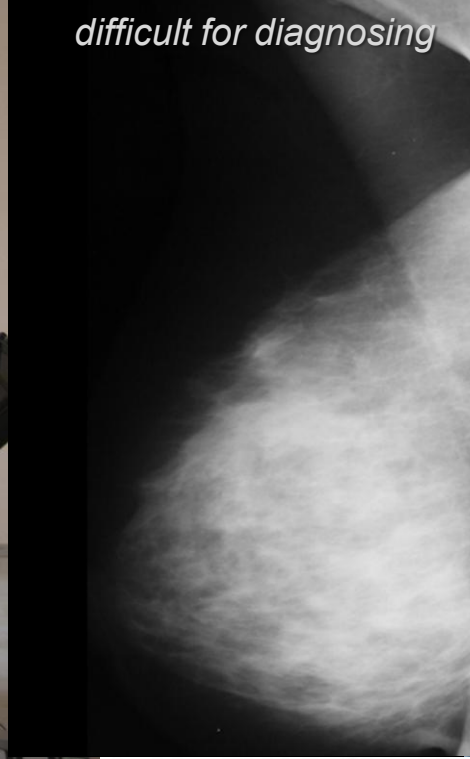
Can we detect the smallest
changes in breast tissue - before
they become cancer?

“the gold standard”

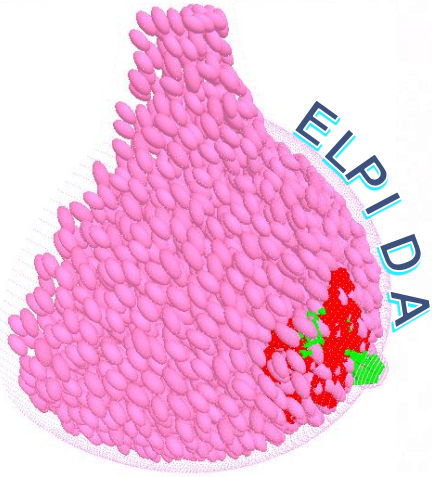
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difficult for diagnosing



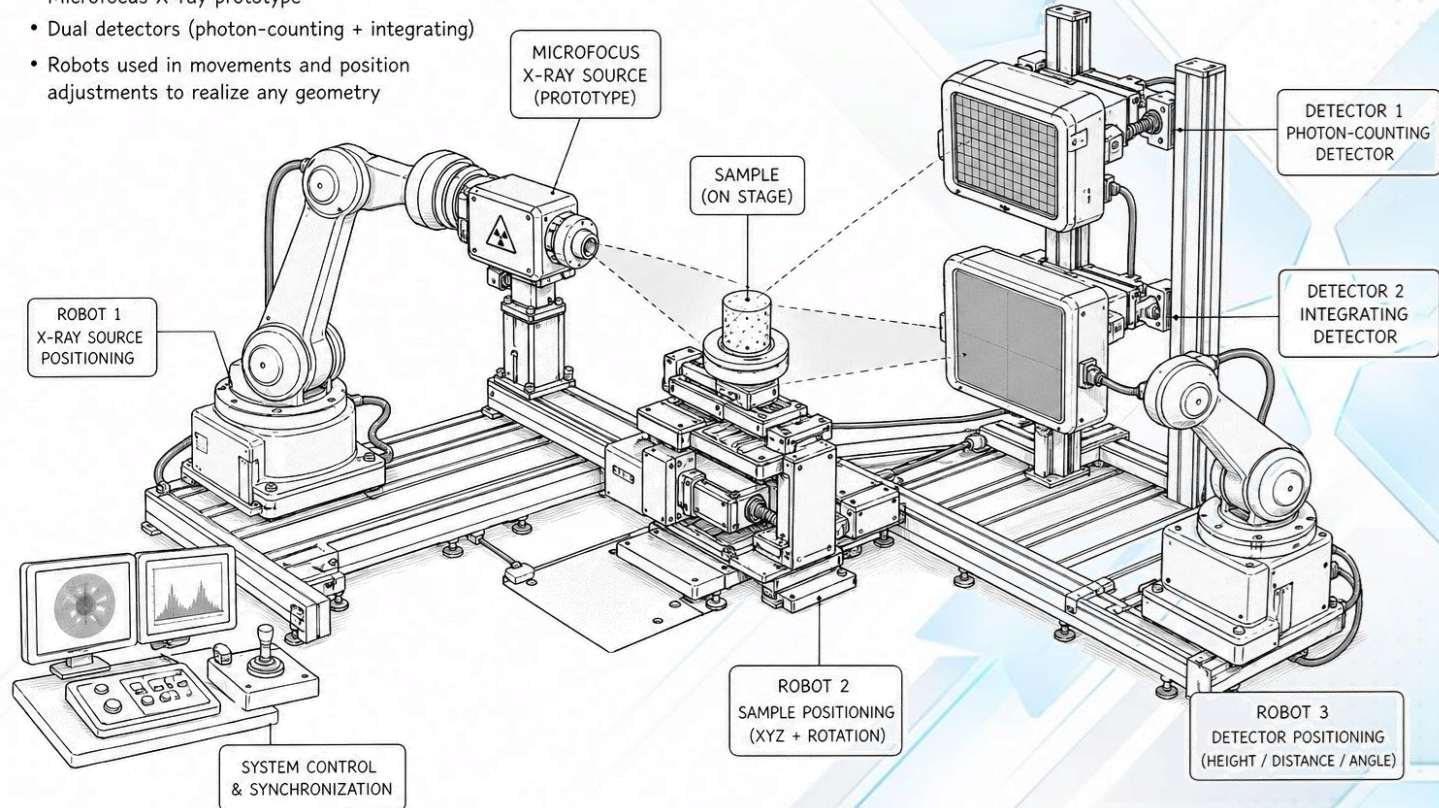
Solution



- **prototype imaging system**
- **realistic anthropomorphic breast phantoms**
- **quantitative optimisation workflows**

MICROFOCUS X-RAY PROTOTYPE REAL SYSTEM

- Microfocus X-ray prototype
- Dual detectors (photon-counting + integrating)
- Robots used in movements and position adjustments to realize any geometry



Prototype specification

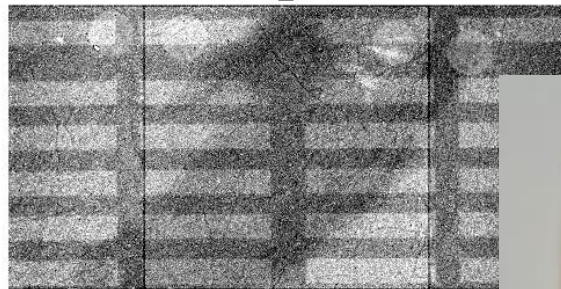
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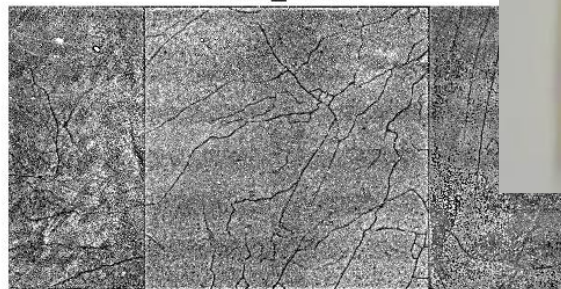
Unique characterisation – spectral detail and context in one system

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60kV_8keV

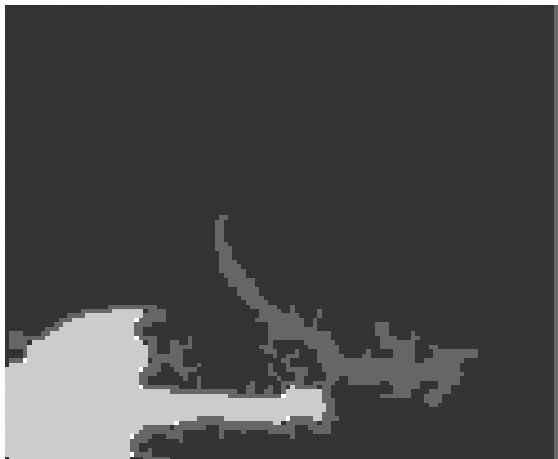


80kV_20keV



Unique: reveals subtle structural details and material composition.

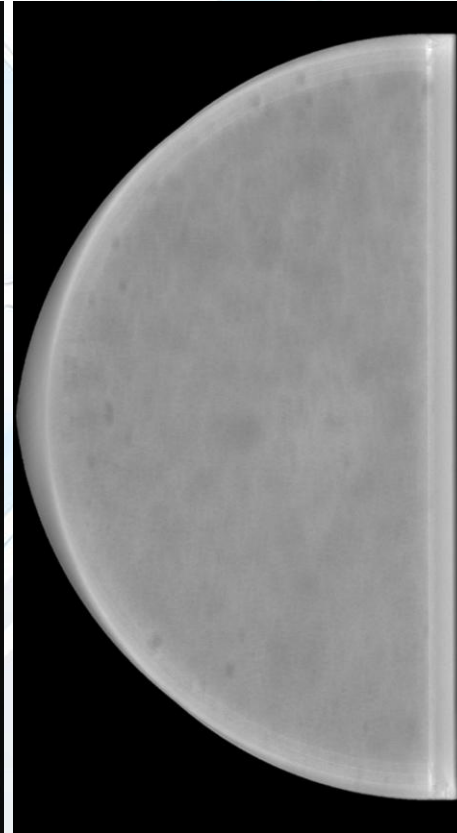
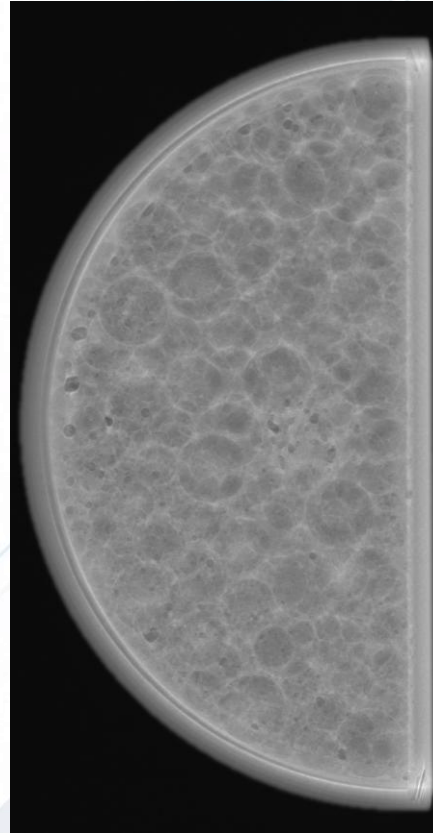
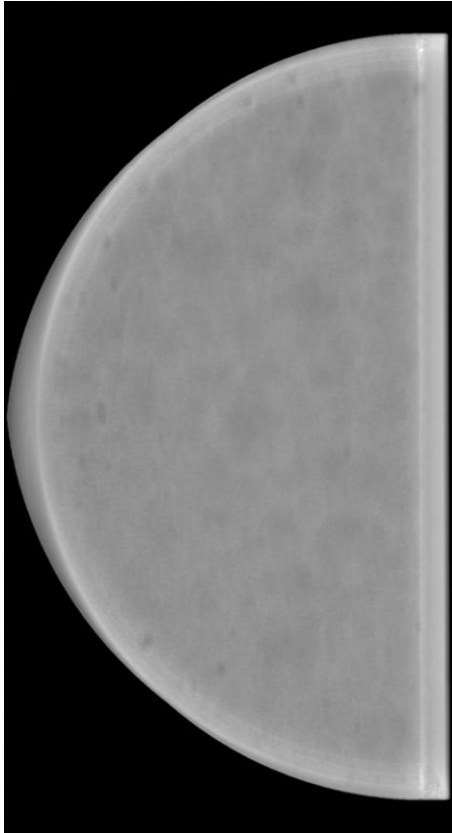
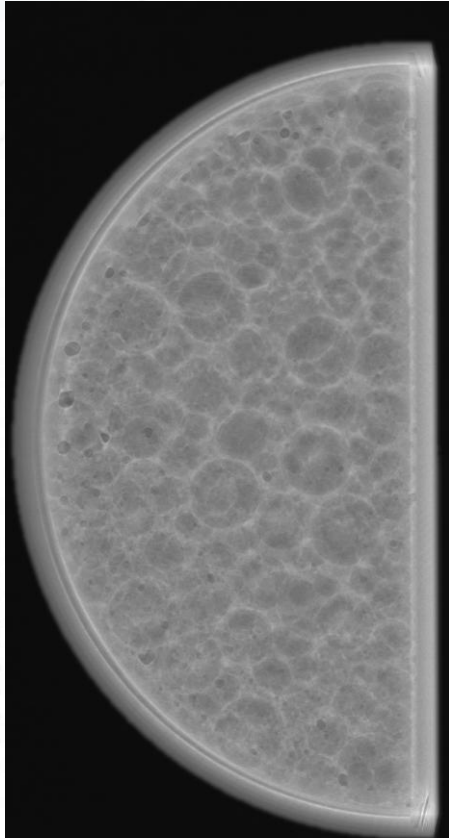
Unique: captures overall structure with high sensitivity and lower noise.



Specifications

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- 5 phantoms;
- Different printing materials;
- Structure elements with different size;
- Tested on a mammography system;
- 2D and 3D mammography.



CORE Team

End-to-end capability: from physics & modelling to prototype and validation

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Scientific & Computational Lead



Nikolay Dukov, BME
Imaging Systems Lead



Zhivko Bliznakov, BME
Algorithms & Integration



Ivan Buliev, BME
Engineering & Prototyping

Target Groups

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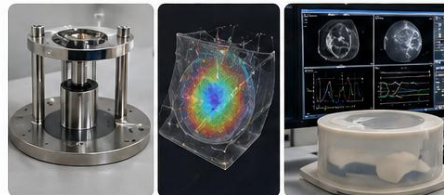
- 1** Imaging companies and R&D teams developing new breast imaging systems



- 2** Research hospitals and academic breast imaging groups



- 3** Medtech companies needing validation tools, not necessarily breast systems



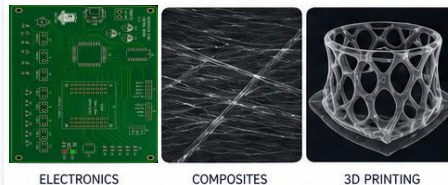
- 4** Academic breast imaging labs



- 5** Industry not limited to breast imaging (security, food inspection, aerospace, automotive)



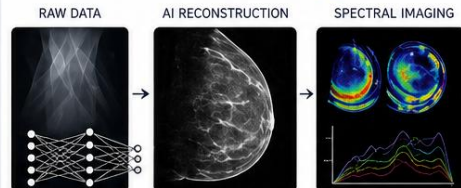
- 6** Non-destructive testing (electronics, composites, 3D printing)



- 7** High-resolution analysis (biomedical, materials, pharma, heritage)



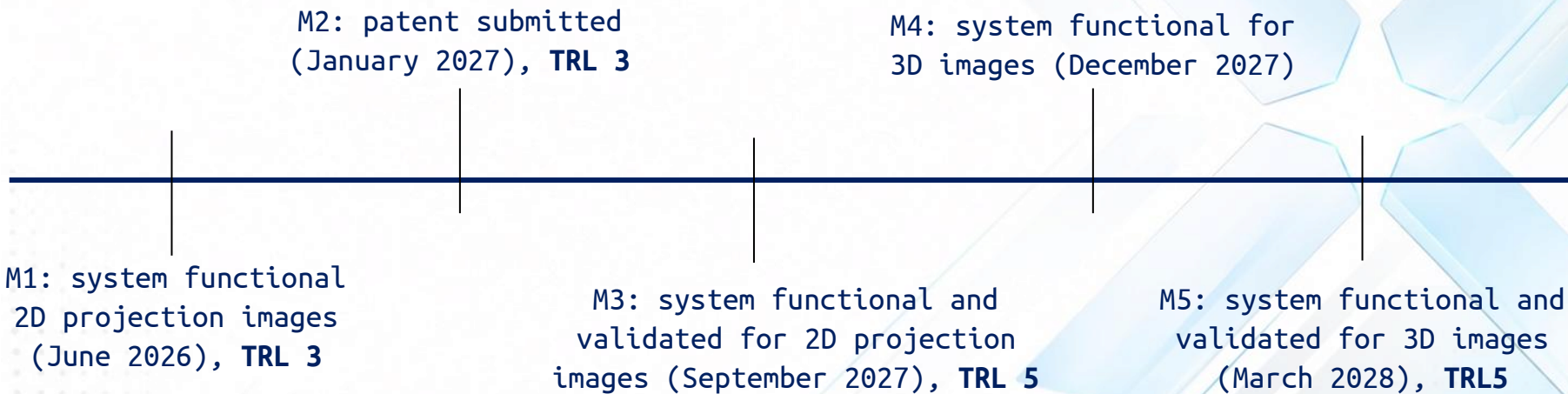
- 8** Algorithm development (AI reconstruction, spectral imaging)



- 9** Archaeological finds



Roadmap prototype/phantom



**“Never be afraid to
ask questions,,
because if you never
ask, the answer is
always no.”**

Sheena Yap Chan

Kristina Bliznakova

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