# AI algorithm FaceAge boosts cancer survival predictions by analysing patients’ facial features



# AI-Powered Face Analysis: A New Tool in Cancer Prognosis

Recent advancements in artificial intelligence (AI) are making significant strides in the healthcare sector, particularly in cancer prognostication. The latest innovation, a deep learning algorithm called FaceAge, is designed to evaluate facial features of cancer patients to predict survival outcomes, often surpassing the short-term life expectancy forecasts made by clinicians. This approach exemplifies a growing trend towards using biological age indicators as critical biomarkers for predicting disease progression and therapeutic responses.

The research, published in *Lancet Digital Health*, employed FaceAge on a dataset comprising 58,851 photos of presumed healthy individuals. It was then applied to 6,196 cancer patients whose images were taken at the initiation of palliative radiotherapy. Disturbingly, the findings revealed that the biological or "FaceAge" of these patients appeared, on average, five years older than their chronological age. The implications of this disparity are significant: patients who visually appeared older based on their FaceAge forecasts displayed substantially poorer survival outcomes, even when adjusted for variables such as chronological age, sex, and cancer type. Notably, this effect was particularly pronounced among patients aged over 85.

Hugo Aerts, co-senior author of the study and director of AI in Medicine at Massachusetts-based Mass General Brigham, stated that the findings underscore the clinical relevance of facial analysis. "This work demonstrates that a photo like a simple selfie contains important information that could help to inform clinical decision-making and care plans for patients and clinicians." Aerts highlighted the potential for FaceAge to contribute to more tailored care strategies, noting that individuals with younger-looking FaceAges tended to respond better to cancer therapy.

Furthermore, the research assessed the efficacy of FaceAge in supporting clinicians' predictions regarding survival outcomes. When clinicians had access to both patient photos and FaceAge analyses, their accuracy in predicting six-month survival rates improved from a mere 61% to 80%. This statistically significant increase suggests that FaceAge can serve as a vital adjunct in clinical settings, aiding professionals in making more informed decisions.

Despite its promising applications, the study’s authors caution that FaceAge is not without its limitations. They highlight the potential for biases inherent in the dataset that may influence readings. Moreover, there exists a need for a more comprehensive understanding of the facial features the AI model employs in its predictions. Jaume Bacardit, an AI specialist at Newcastle University, emphasised this point, asking, "Which parts of the face are they basing their predictions on? This will help identify potential confounders that may go undetected otherwise."

The interest in biomarkers for ageing is growing, paralleling research efforts like those at Stanford Medicine, where another AI model named MUSK has been developed. This model integrates visual and textual data to provide multidimensional insights into cancer prognoses, demonstrating the expanding role of AI in enhancing cancer care through comprehensive data analysis. Additionally, Harvard Medical School has unveiled the 'Chief' model, which boasts a remarkable accuracy of up to 94% in detecting various cancer types, marking a pivotal step forward in AI-assisted medical diagnostics.

As researchers continue exploring the potential of FaceAge and similar technologies, there are broader implications for healthcare. Advances in biomarkers are signalling a shift towards precision medicine, offering insights that could refine treatment protocols and patient care. Nevertheless, ethical considerations surrounding data management and AI's expanding role remain critical for realising these promising advancements.

In conclusion, the confluence of AI and medicine presents transformative opportunities for enhancing cancer care through innovative tools like FaceAge. As researchers deepen their exploration into biological age biomarkers, the potential for improved patient outcomes could usher in a new era of personalised oncology, making significant strides in the fight against cancer.

## Reference Map:

* Paragraph 1 – [[1]](https://www.ft.com/content/3ac60aaf-3b55-4f1c-858c-7b42b4cbd914), [[6]](https://www.ft.com/content/3ac60aaf-3b55-4f1c-858c-7b42b4cbd914)
* Paragraph 2 – [[2]](https://pmc.ncbi.nlm.nih.gov/articles/PMC10516042/), [[6]](https://www.ft.com/content/3ac60aaf-3b55-4f1c-858c-7b42b4cbd914)
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* Paragraph 5 – [[2]](https://pmc.ncbi.nlm.nih.gov/articles/PMC10516042/), [[3]](https://news.stanford.edu/stories/2025/01/ai-cancer-prognosis)
* Paragraph 6 – [[4]](https://www.ft.com/content/0a8f2c61-77f4-43ce-87d2-a7b421bbda85)
* Paragraph 7 – [[5]](https://www.ft.com/content/33ed8ad0-f8ad-42ed-983a-54d5b9eb2d27)

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## Bibliography

1. <https://www.ft.com/content/3ac60aaf-3b55-4f1c-858c-7b42b4cbd914> - Please view link - unable to able to access data
2. <https://pmc.ncbi.nlm.nih.gov/articles/PMC10516042/> - This study demonstrates that deep learning algorithms can estimate biological age from facial photographs, providing prognostic information related to survival in cancer patients. The researchers trained a model called FaceAge on a large dataset of healthy individuals' photos and applied it to cancer patients, finding that those who appeared older than their chronological age had worse survival outcomes. The study suggests that FaceAge can serve as a clinically useful biomarker, potentially improving precision medicine by offering objective, quantitative measures of a patient's physiological status.
3. <https://news.stanford.edu/stories/2025/01/ai-cancer-prognosis> - Researchers at Stanford Medicine have developed an AI model named MUSK, capable of integrating visual and textual data to predict cancer prognoses and responses to treatment. Trained on millions of medical images and pathology-related texts, MUSK outperformed standard methods in predicting disease-specific survival across various cancer types. The model also identified patients likely to benefit from immunotherapy and those at risk of melanoma recurrence. This advancement highlights the potential of AI in enhancing cancer care by incorporating diverse data sources for more accurate predictions.
4. <https://www.ft.com/content/0a8f2c61-77f4-43ce-87d2-a7b421bbda85> - A new AI foundation model, 'Chief', developed by Harvard Medical School, marks a significant advancement in cancer diagnosis by accurately detecting multiple cancer types, assessing treatments, and predicting survival rates. Trained on millions of unlabelled and whole-slide images of tissues, Chief has shown a high accuracy of up to 94% for cancer detection, outperforming existing AI methods by up to 36%. The AI's ability to link tumor cell patterns to genomic aberrations can potentially suggest effective treatments without expensive DNA sequencing. Chief can provide early identification of patients who might benefit from specific molecular treatments, even in regions where such evaluations aren't usually available. This model represents a major step forward in AI-assisted medical diagnostics, promising enhanced accuracy in cancer evaluation and indicating broader applicability across various medical disciplines.
5. <https://www.ft.com/content/33ed8ad0-f8ad-42ed-983a-54d5b9eb2d27> - The report from the FT Tech for Growth Forum 2025 explores how next-generation artificial intelligence (AI) can be harnessed to foster societal improvements, with a focus on agriculture, healthcare, and environmental conservation. AI can help mitigate climate change effects, enhance agricultural yields, and optimize water use, contributing to food and water sustainability as population pressures rise. In agriculture, AI enhances precision farming, guides resource management, and improves yields using predictive models and smart technology. In healthcare, AI drives efficiency in diagnostics and treatment, though consistent data management and standardization remain challenges. Additionally, AI aids in environmental conservation by monitoring ecosystems, detecting illegal activities, and assisting in biodiversity preservation. The report highlights the ethical considerations and the need to manage growing energy demands from AI, advocating for tailored small language models (SLMs) for specific purposes. Overall, while AI presents vast opportunities for societal benefits, careful implementation and balancing human elements are crucial for success.
6. <https://www.ft.com/content/3ac60aaf-3b55-4f1c-858c-7b42b4cbd914> - Scientists have developed an AI-powered tool called FaceAge that uses facial analysis to predict survival outcomes in cancer patients, often outperforming clinicians. Using a deep learning algorithm trained on over 58,000 photos of healthy individuals, researchers evaluated 6,196 cancer patients and found that their biological, or 'FaceAge,' appeared on average five years older than their chronological age. The study, published in Lancet Digital Health, demonstrated that a higher FaceAge correlates with lower survival chances, independent of age, sex, or cancer type. FaceAge notably improved clinicians' accuracy in predicting six-month survival from 61% to 80%. Despite its promise, the system has limitations, including potential data biases and model errors. Researchers continue to expand testing to assess its utility in predicting general health and lifespan. The study contributes to the broader field of aging biomarkers, where perceived aging is also investigated as a predictor of disease, though it requires human observation. Experts stress the importance of understanding which facial features the AI uses to improve transparency and identify possible confounders.