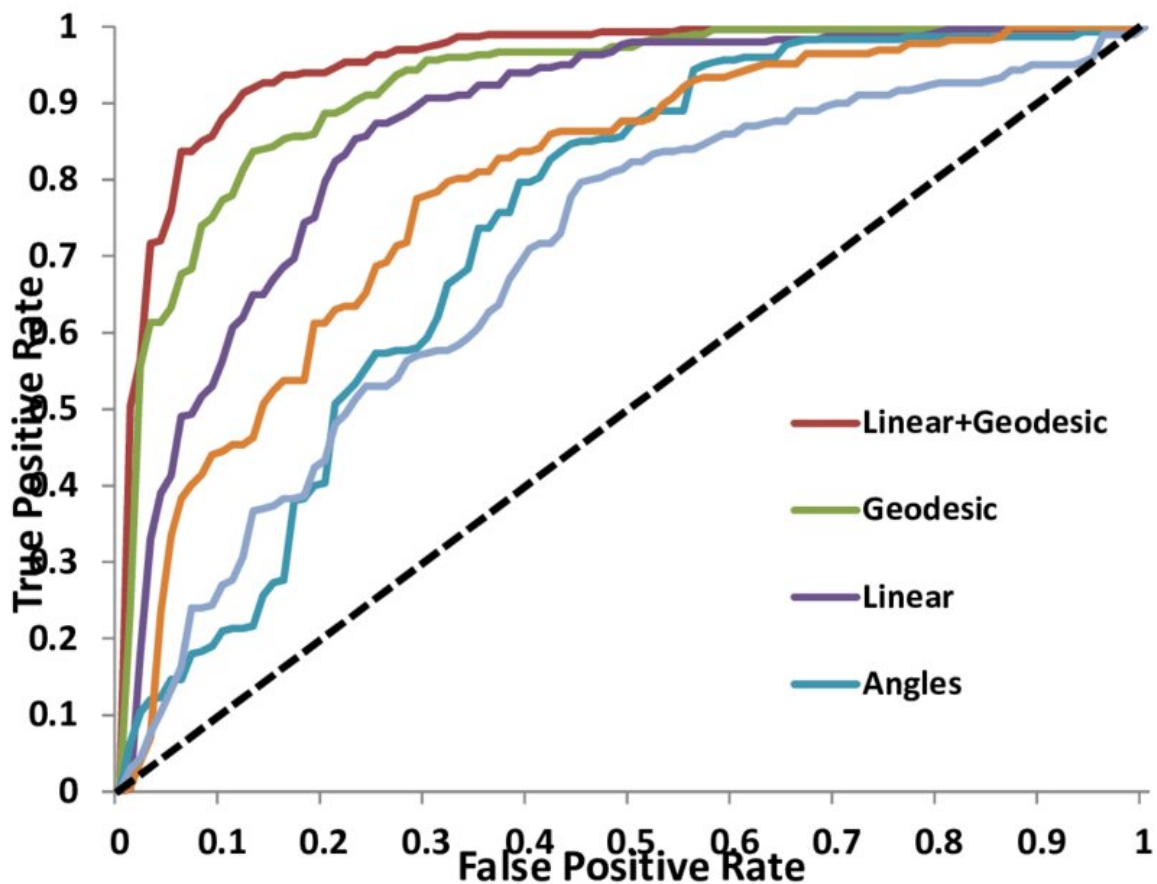


# 3-D facial photography offers quick way to predict sleep apnea

August 15 2019, by Simone Hewett



Receiver Operator Characteristic (ROC) curves showing the sensitivity (true positive rate) and specificity (false positive rate) for predicting Obstructive Sleep Apnea (AHI $\geq$ 5)

Three-dimensional facial photography can provide a simple and highly accurate method of predicting the presence of obstructive sleep apnea, according to a study led by The University of Western Australia.

The research, published in the *Journal of Clinical Sleep Medicine*, builds on previous work identifying that the structure of the face, head and neck played a key role in diagnosing sleep apnea.

Professor Peter Eastwood, director of the Centre for Sleep Science, and his research team ran overnight [sleep studies](#) while Dr. Syed Zulqarnain Gilani, from UWA's School of Computer Science and Software Engineering, analyzed the 3-D faces.

"What we found was that we could predict the presence of obstructive sleep apnea with 91 percent accuracy when craniofacial measurements from 3-D photography were combined into a single predictive algorithm," Dr. Gilani said.

Sleep disorders are estimated to cost the Australian health system more than \$5 billion annually. More than half the cost is associated with sleep apnea which is associated with snoring and repeated periods of 'choking' during sleep.

Sleep apnea causes daytime sleepiness and is strongly linked to sleepiness related accidents, diabetes, cardiovascular diseases, and depression. Despite sleep apnea being treatable, the vast majority—up to 75 percent—of individuals remain undiagnosed.

This is largely because current methods of assessing sleep apnea are expensive and access to them is limited.

The study recruited 400 middle-aged men and women who took part in sleep studies at UWA's Centre for Sleep Science and Sir Charles

Gairdner Hospital while their faces were analyzed from 3-D photographs. Participants were also recruited from Western Australia's Raine Study.

The study suggested that it might also be possible to predict the severity of a person's sleep apnea from these photographs.

"This breakthrough has the potential to reduce the burden on hospitals and sleep clinics that currently run sleep studies for everyone," Dr. Gilani said. "It can flag people at risk of sleep apnea who can then be referred for diagnosis and treatment."

## What is the Raine Study?

The Raine Study is one of the largest prospective cohorts of pregnancy, childhood, adolescence and now early adulthood to be carried out anywhere in the world. The Raine Study's purpose is to improve human health and well-being, through the study of a cohort of Western Australians from before birth onwards. 2900 [pregnant women](#) entered the study between 1989 and 1991 and 2868 live births were recruited into the cohort. These children born into the study, their parents, their grandparents and now their own children are part of one of the world's most successful multi-generational pregnancy cohort studies.

**More information:** Peter Eastwood et al. "Predicting sleep apnea from 3-dimensional face photography" *JCSM*: official publication of the American Academy of Sleep Medicine, 2019.

[www.researchgate.net/publication/331111111](http://www.researchgate.net/publication/331111111)

Provided by University of Western Australia

Citation: 3-D facial photography offers quick way to predict sleep apnea (2019, August 15)  
retrieved 10 April 2024 from

<https://medicalxpress.com/news/2019-08-d-facial-photography-quick-apnea.html>

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