

# SNEC sets sights on cutting waiting times with smart scheduling system

Machine-learning solution offers best schedule for patients; will be used at all SingHealth institutions

Adeline Tan

The Singapore National Eye Centre (SNEC) is looking at using technology to reduce waiting times for its patients by up to half.

The centre, which is under Singapore's largest public healthcare group SingHealth, will roll out a machine-learning solution called the Appointment Scheduling Optimiser (ASO) in the fourth quarter of this year.

Developed by Singapore-based information, communications and technology company NCS, the ASO will eventually be deployed across all SingHealth institutions, which include polyclinics, hospitals and specialist centres.

SingHealth's deputy group chief operating officer of shared services Charity Wai said waiting times at SNEC can stretch to 45 minutes on busy days.

"We need to make the appointments in our clinics more streamlined," she said. "The objective is to be a smart eye hospital, and one of the areas identified was making the clinic processes more streamlined."

At SNEC, patients typically have to take a number of tests before seeing the doctor. But currently, appointments are given on a first-come, first-served basis and do not take into account the preceding tests.

This means that a patient who needs only one test may be sched-



IMPROVING EFFICIENCY

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**MS CHARITY WAI**, SingHealth's deputy group chief operating officer of shared services, on the Appointment Scheduling Optimiser, which will be rolled out at Singapore National Eye Centre in the fourth quarter of this year.

An outpatient clinic at the Singapore National Eye Centre. Waiting times there can stretch to 45 minutes on busy days. PHOTO: SINGAPORE NATIONAL EYE CENTRE

uled behind one who needs multiple tests, causing a bottleneck and increasing waiting times for the other patients.

The ASO will take into account the resources available, as well as all the various tests that patients will have to take, and churn out the best possible schedule with minimal waiting times.

While simulations of the ASO have shown that waiting times can be cut down to about 20 minutes, the presence of complex cases - which make up about 15 per cent to

20 per cent of all patients - may cause this to vary as these patients often need more time.

The SNEC had tried to increase its manpower, but the long waiting times persisted.

Mr Howie Sim, vice-president of the healthcare and transport client service unit at NCS, said it would not be possible for an employee to attempt what the ASO can do as there were too many variables, such as the sequence of tests, for the employee to be able to find an optimal solution.

Over time, the ASO can pick up patterns from the data such as the need to allocate a longer time for a particular profile of patients, such as the elderly.

Mr Sim said: "This artificial intelligence technology has been around for decades, but traditionally it has been applied more to sectors such as manufacturing that require clockwork-like precision."

He added: "The adoption (of such technology) to drive innovation in healthcare has made headway in recent years."

Ms Wai hopes that with an optimised schedule, manpower needs will be better allocated at SNEC. For example, staff can be deployed based on the ASO's overview of when crowds will peak at the centre.

She said: "We will have a better idea of demand and supply that allows us to plan for the manpower much better, because we will be able to anticipate the workload and distribute it evenly."

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An NFT horse on Zed Run, a platform where players can buy, breed and race digital steeds. People - most of them crypto enthusiasts - are rushing to snap up the digital horses, which arrive on Zed Run's site as limited-edition drops; some of them have fetched higher sums than living steeds. PHOTO: NYTIMES

**Osaka Champions Cup**  
JP · Osaka · 2200m · Class IV

**GATE 5**  
**ATAR!**

STABLES	CAREER
Doofy Racing	86-53-31
WIN-RATE	GENOTYPE
15.61%	Elite
GENERATION	BLOODLINE
Z6	Nakamoto

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BETA  
**ZED**  
REPLAY

## Digital racehorses are the talk of the crypto world

NEW YORK • The Kentucky Derby may be the best-known stakes race in the equestrian world, but it is hardly the only one.

On Zed Run, a digital horse racing platform, several such events take place every hour, seven days a week. Owners pay modest entry fees - usually between US\$2 (S\$2.60) and US\$15 - to run their steeds against others for prize money.

The horses in these online races are non-fungible tokens (NFTs), meaning they exist only as digital assets. You cannot pet them or feed them carrots by hand. You cannot sit in the stands sipping mint juleps while they sprint by.

But, unlike the vast majority of NFTs - which correspond to GIFs, images and videos that can be kept as collectibles or sold for profit - each digital horse constitutes what Zed Run's creators call a "breathing NFT".

"A breathing NFT is one that has its own unique DNA," said Mr Roman Tirone, head of partnerships at Virtually Human, the Australian studio that created Zed Run.

"It can breed, has a bloodline, has a life of its own. It races, it has genes it passes on, and it lives on

an algorithm so no two horses are the same."

(Yes, owners can breed their NFT horses in Zed Run's "stud farm".)

People - most of them crypto enthusiasts - are rushing to snap up the digital horses, which arrive on Zed Run's site as limited-edition drops; some of them have fetched higher sums than living steeds.

One player sold a stable full of digital racehorses for US\$252,000. Another got US\$125,000 for a single racehorse. So far, more than 11,000 digital horses have been sold on the platform.

Mr Alex Taub, a tech start-up founder in Miami, has purchased 48 of them.

"Most NFTs, you buy them and sell them, and that's how you make money," Mr Taub, 33, said. "With Zed, you can earn money on your NFT by racing or breeding."

His stable is still growing. He recently bred a digital horse for his five-year-old daughter.

"She comes home from school and wants to race it," he said. "She named her horse Gemstone, and Gemstone had two babies named Rainbows and Sparkles."

Each race has a 12-horse limit,

ARUN FOR THEIR MONEY

**Most NFTs, you buy them and sell them, and that's how you make money. With Zed, you can earn money on your NFT by racing or breeding.**



**MR ALEX TAUB**, a tech start-up founder in Miami, on Zed Run, a digital horse racing platform.

the line-ups of which are based on the qualities and past performance of each horse. The site uses an algorithm that runs 10,000 random outcomes and chooses one as the race's condition.

The races take place around the clock and are streamed on both Zed Run's Twitch channel and the company's website.

Zed Run also operates a Discord server, where people can follow race results, trade tips and share third-party tools for analysing

data. Users live-stream their own races and repackage clips for YouTube and Twitch.

"There are people who are becoming mini influencers in this ecosystem themselves," said Mr Yair Altmarm, a venture capitalist in New York who has spent over US\$300,000 on digital horses. "And horses that are getting credibility on these streams and exposure on the Discord are making a name for themselves."

He anticipates making much of his money back.

"It wouldn't surprise me if some of these horses are trading for US\$1 million in a couple of months," Mr Altmarm, 23, said, "because these horses can generate a crazy return on your investment."

It costs anywhere from a few dollars to around US\$50 to enter a buy-in race, and you can race a horse an unlimited number of times.

Zed Run was founded in 2018 by Mr Chris Laurent, Mr Rob Salha, Mr Geoff Wellman and Mr Chris Ebeling. They felt that horse racing was fertile ground for innovation.

"It's one of the world's oldest sports, and it has remained un-

changed since the dawn of time," Mr Laurent said.

Owning and racing real horses can be prohibitively expensive. But there is a lower barrier to entry for NFT horse racing, according to Mr Drew Austin Greenfeld, 36, an investor in New York. "There are cheap horses and premium horses," he said.

Ms Renee Russo, a 25-year-old entrepreneur in New York, said racing her digital horse, Glacial Planes, feels more like playing a video game than taking a gamble.

"I own this horse. I'm not betting on another horse," she said. "So I feel like I have complete control of where it's going, who it's racing and who I want to breed it with."

As with all investments, there is reason for caution here. Should Zed Run turn out to be a fad, these digital horses could be rendered worthless.

Fans of digital horse racing often talk about the "metaverse", a shared space where physical and virtual reality meet.

"My opinion is that Zed Run will be the first digital sport of the metaverse," Mr Greenfeld said. "People are going to root for horses and stables, and become

fans. There are horses that are already celebrities in the ecosystem. It's global, there's no language barrier and it's 24/7. It takes the best of crypto, NFTs, e-sports, streaming."

In any case, as the NFT craze grows and more people discover digital horse racing, Zed Run is expanding rapidly. The company has 30 employees around the world and plans to keep hiring.

Recently, celebrities and athletes have begun investing in the space.

Jerry Ferrara, who played Turtle in the HBO series Entourage, has purchased a digital horse, as did Wilson Chandler, a professional basketball player.

Some users said Zed Run has also piqued their interest in the real-world spectator sport.

"I would have never watched an actual horse race on YouTube before, but I've watched five now because of the idea of just familiarising myself with how actual horse racing works," Mr Altmarm said.

Mr Taub, for his part, is going all in on digital races. He plans to purchase more horses in the next Zed Run drop to build out his stable.

"This is either going to be the smartest or stupidest thing I've ever done," he said. "I'll either buy a house with the money I make from it or never show my face for a year." NYTIMES