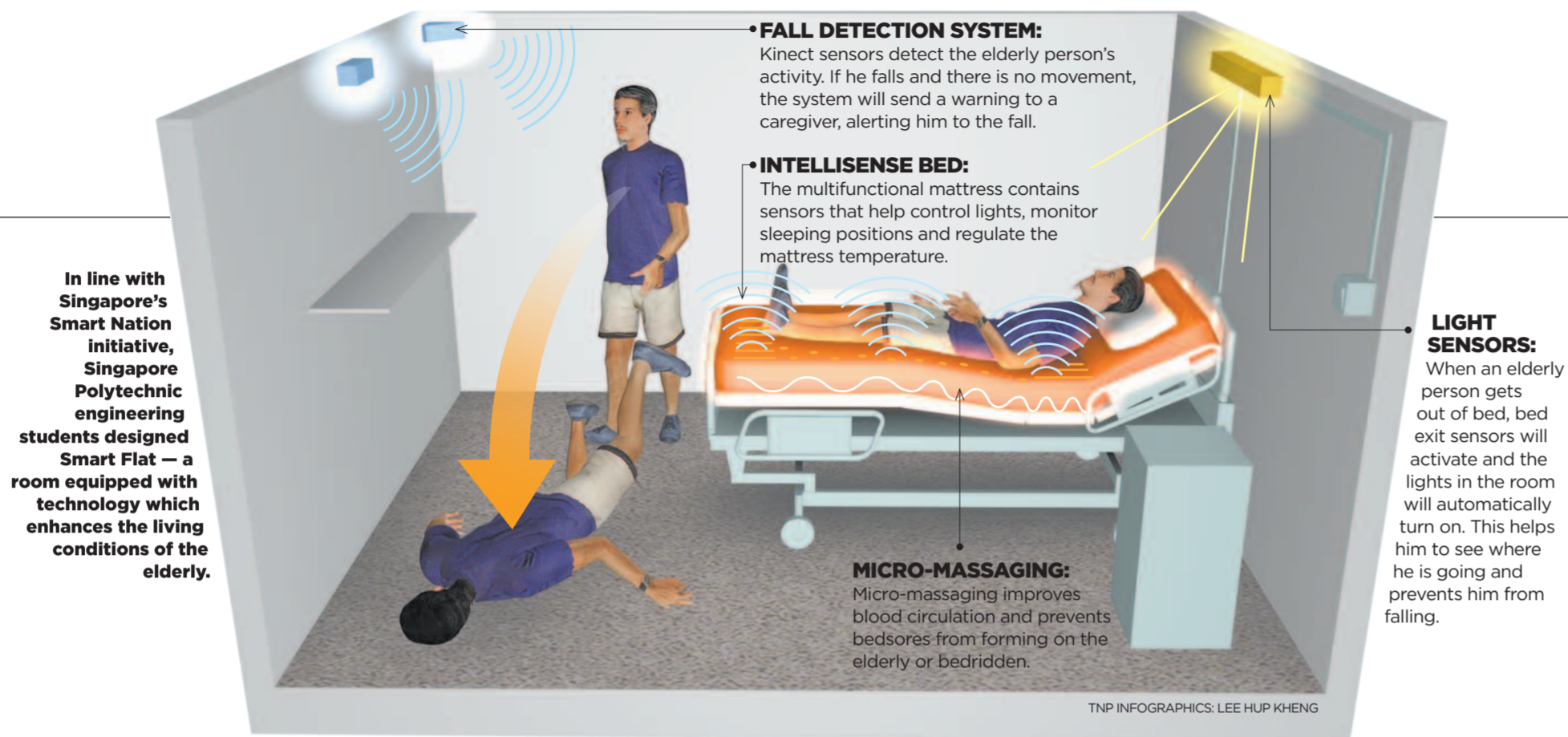


ABOUT SMART FLAT



With this suit, hopefully young people can better understand the challenges faced by the old folk in their daily life.

— Mr Javier Chan on the Silver Suit

Two Singapore Polytechnic students were inspired by their grandparents in their inventions

Fall detection system helps to look after the elderly

Reports by GODWIN NG
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Three years ago, Mr Lin Hai Qiang's grandfather fell at home and fractured his left knee.

As there was no one else at home, the elderly man was unable to call for help and suffered in pain for hours, lying on the kitchen floor in agony.

The incident inspired Mr Lin, 23, a final-year aerospace electronics student at Singapore Polytechnic (SP), to come up with a fall detection system for his final-year project.

Designed by Mr Lin and his course-mate, Mr Yeo Yong Ming, 20, the system consists of two Kinect sensors that measure the speed of a subject's body movements using infrared.

When an unusually high speed is recorded and the subject does not get up after 20 seconds, a warning will be sent via text message to family members.

An alarm outside the subject's house will also ring, alerting neighbours to the fall.

Mr Jaichandar K S, 42, senior lecturer at SP's School of Electrical & Electronic Engineering, said: "When elderly people fall, they may be unable to call for assistance. With this system, the car-



Once it's fine-tuned, I will consider installing it in my grandfather's house. If I can't look out for him, at least the system will look out for him.

— Mr Lin Hai Qiang

giver is alerted once the sensors detect no activity."

The fall detection system is just one of 65 projects on display at SP's annual Engineering Show, which is open to the public and ends today. Admission is free.

Mr Lin's project and another student project, Intellisense Bed, are part of SP's Smart Flat for Elderly display. (See infographics above.)

The polytechnic student said he was glad that he helped to develop the fall detection system.

PERMANENT DAMAGE

He said: "Because my grandfather didn't receive treatment immediately, his knee suffered permanent damage.

"Now, he walks with a limp. If this system had been around then, maybe he wouldn't have to suffer so much."

The system also offers more privacy, compared to surveillance cameras.

"Cameras can be a bit intrusive when someone is changing clothes," he said.

The system has a 82 per cent accuracy and Mr Lin and his course-mate hope to keep working on improving it.

"Once it's fine-tuned, I will consider installing it in my grandfather's house.

"If I can't look out for him, at least the system will look out for him."



INNOVATIVE: Mr Lin Hai Qiang (right) and Mr Yeo Yong Ming took nearly a year to develop their fall detection system.



TEAMWORK: Mr Javier Chan's (wearing the suit) groupmates helping him to put on the Silver Suit, which simulates the ageing effect on the body.

TNP PHOTOS: JONATHAN CHOO

Suit gives wearer feel of being old

Until he was 17 years old, Mr Javier Chan lived with his grandmother.

During that time, he noticed that the elderly woman had trouble getting around the house and wondered what it felt like to be old.

Said Mr Chan, now 19: "She always complained that it's difficult for her to get out of bed.

"I felt for her, even though I couldn't feel what she was going through."

So, together with three of his course-mates, the final-year aeronautical engineering student at Singapore Polytechnic designed what they call the Silver Suit.

The suit gives the wearer a taste of what it is like to be old by simulating the ageing effects of the body.

Gas springs in the lower region of the suit restrict the wearer's leg move-

ments, making it difficult to walk.

Resistance bands also help mimic the stiff elbows and shoulders of the elderly, while an actuator on the back of the suit forces the wearer into a hunchback position by pushing his back forward.

Mr Chan said: "After wearing the suit, I can better understand what my grandma experiences every day."

NINE MONTHS

Creating the Silver Suit, which took nine months, was not all smooth sailing.

"The manufacturing of the suit was very difficult. Even 0.01mm made a big difference in the end product."

But Mr Chan believes the hard work is worth the effort.

"With this suit, hopefully young people can better understand the challenges faced by the old folk in their daily life."