

## **Project Title**

Fun Knee: Inserting Fun into Rehab

## **Project Lead and Members**

Project lead: Ashton Neoh

Project members: Khaw Xin Yue, Wong Jia Yen

## **Organisation(s) Involved**

Tan Tock Seng Hospital

## **Healthcare Family Group(s) Involved in this Project**

Allied Health, Medical

## **Applicable Specialty or Discipline**

Physiotherapy

## **Project Period**

Start date: 2015

Completed date: 2016

## **Aims**

To introduce fun into rehabilitation programmes through the use of technology

## **Background**

The advent of technology has given room to reimagine our approach to care, with traditional repetitive therapy modes and laborious processes transformed through automation and creative use of technology to make therapy sessions engaging and efficient. Technology has also enabled more accurate diagnoses and timely interventions for patients.

## Methods

Implementation of gamification by physiotherapists for post Total Knee Replacement (TKR) introduced an element of fun into their rehabilitation programme. This innovation leverages motion sensor technology to enhance the thrill and excitement of games, while performing foundational movements for TKR rehabilitation.

## Results

The programme has encouraged patients to take an active role towards their own recovery.

## Lessons Learnt

Have to focus on users' wants and needs to obtain buy in.

## Conclusion

Digital solution like Fun Knee is feasible way to optimise rehabilitation

## Additional Information

Awards and Recognition:

- Singapore Health Innovation Challenge – First Prize (2016)
- Singapore Healthcare Innovation Technology (HIT) Challenge – First Prize (2016)
- Institute of Electrical and Electronic Engineers (EEE), Serious Games and Applications for Health (SEGAH) – Best Paper Award (2017)
- International Joint Conference on Artificial Intelligence (IJCAI) – Most Entertaining Video Award (2018)

## Project Category

Technology

Digital Health, Sensors

Care Continuum, Rehabilitative Care

**Keywords**

Total Knee Replacement, Serious Games, Gamification, Rehabilitation Therapy,  
Patient Activation

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## VIII. DELIVERING VALUE THROUGH TECHNOLOGY

With healthcare innovations increasingly incorporated into our work processes, they revolutionise the way we work and enhance the capability to deliver personalised care. As healthcare innovations are adopted, these technological solutions and automation in turn catapult us towards a future of value creation.

As we focus on Value for Money in healthcare, we need to understand how technological solutions transform our care delivery in order to achieve both improved health outcomes and cost sustainability.

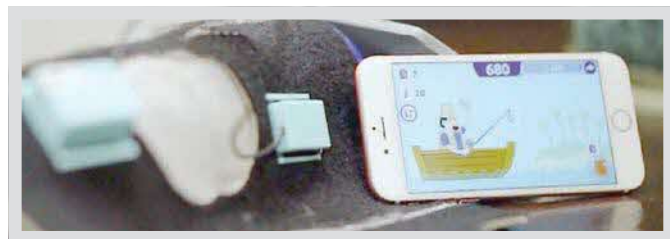
### USING TECH TO TRANSFORM CARE

The advent of technology has given us room to reimagine our approach to care. Traditional repetitive therapy modes and laborious processes have been transformed through automation and creative use of technology to make therapy sessions engaging and efficient. Technology has also enabled more accurate diagnoses and timely interventions for patients.

#### Fun Knee: Inserting Fun Into Rehab

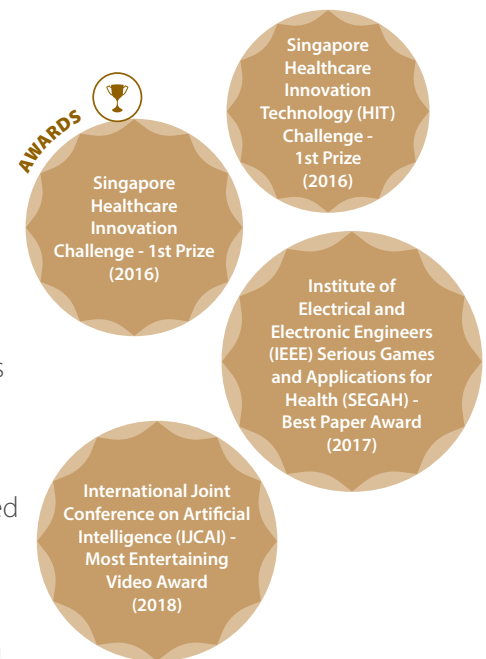
A key project that demonstrates gamification is Fun Knee, a programme designed by our physiotherapists for post Total Knee Replacement (TKR) patients which

introduces an element of fun into their rehabilitation programme. Leveraging motion sensor technology, this award-winning innovation enhances the thrill and excitement of these games, while performing foundational movements for TKR rehabilitation.



Fun Knee introduces an element of fun in patients' rehabilitation through gamification using mobile phones.

This programme encourages our patients to take an active role towards their own recovery. Fun Knee's innovative effort clinched the first prize in the Singapore Healthcare Innovation Challenge (HIT) in 2016. It also won the Best Paper Award at the IEEE 5th International Conference on Serious Games and Applications for Health (SEGAH), and the Most Entertaining Video Award (2018) at the International Joint Conference on Artificial Intelligence (IJCAI).



“With Fun Knee, I can play games while exercising my operated knee at home, it is definitely more fun, and I enjoy it!”

**Patient enrolled in the Fun Knee Programme**