



**TEAM MAS**



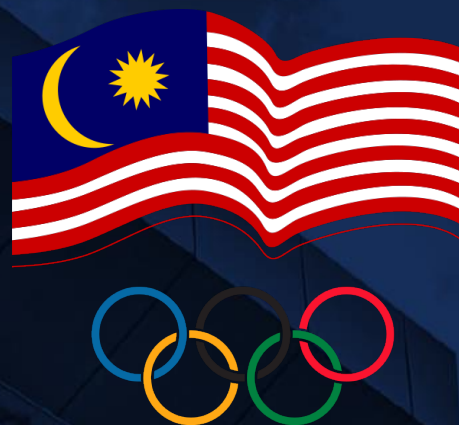
**ISN**

# **SPORTS PERFORMANCE INNOVATION & TECHNOLOGY: MALAYSIA'S JOURNEY**

**AHMAD FAEDZAL MD RAMLI**  
**CEO**  
**NATIONAL SPORTS INSTITUTE OF MALAYSIA**

WHERE LEGENDS ARE MADE

# MALAYSIA'S HIGH PERFORMANCE SPORTS PROGRAM: THE SPIRIT OF COOPERATION



## NATIONAL SPORT ASSOCIATIONS

- 795 athletes
- 87 coaches
- 30 sports

# ISN

## OUR JOURNEY



2012



2016



The Podium Program is a high-performance sports initiative aimed at elevating Malaysia's athletes to world-class standards, particularly in preparation for major international competitions like the Olympic Games, Asian Games & Commonwealth Games. The primary goal was to develop a structured approach to support elite athletes capable of competing and challenging on the global stage.

Key features:

- Comprehensive support for athletes
- Data-driven approach
- Partnerships with global experts
- Strategic focus on selected sports

## Olympic Rio 2016 : Outcome

Malaysia achieved our best-ever Olympic performance at the Rio 2016 Olympics, securing a total of 5 medals: 4 silver and 1 bronze. This marked a significant milestone for our sporting history.

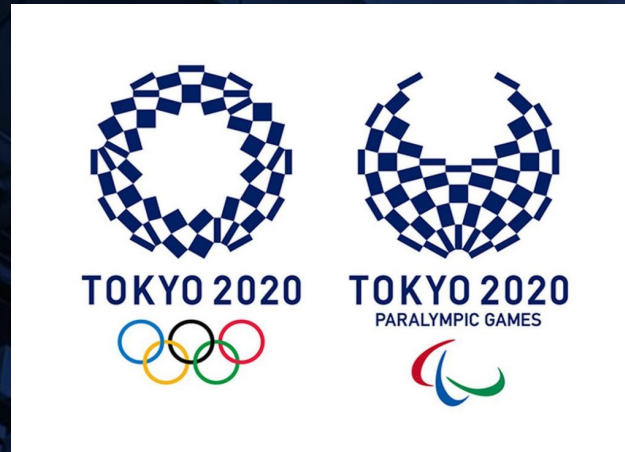


# OUR JOURNEY

2016



2021

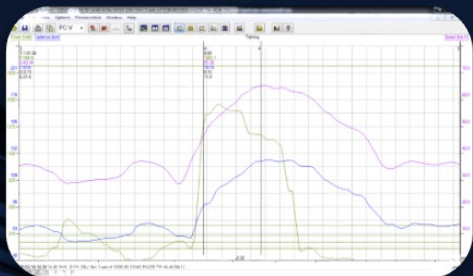
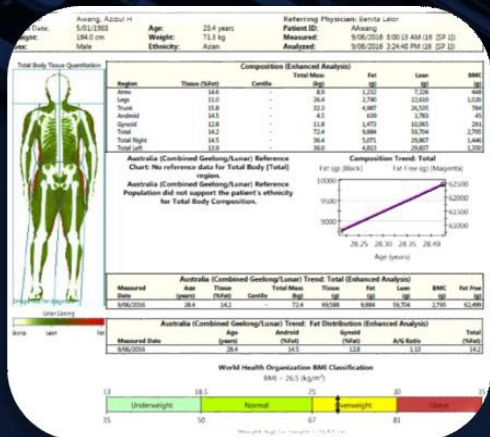


## Post Rio 2016

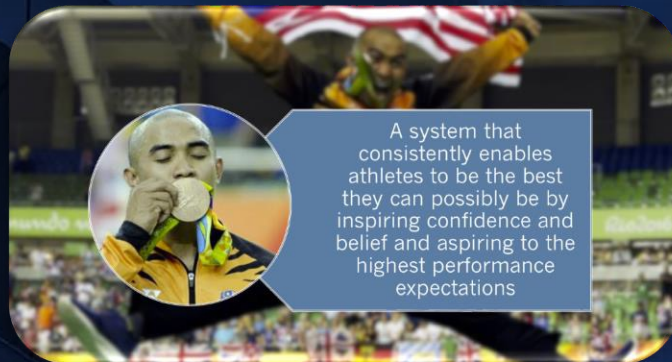
A special R&D funding was allocated as a proof of concept initiative – marginal gain project. This initiative aims to explore innovative solutions towards enhancing performance, optimising athlete support system, and further drive Malaysia high performance sport through the application of cutting-edge sports science and technology.

## TOKYO 2020: PROJECT 2020 Perform with Confidence

Power (muscle) determinants of physical performance



## TARGETTED ATHLETES



High Performance Culture  
(Purpose, Values, Planning, Accountability)

**PURPOSE** | Why we believe in Malaysian Cycling  
**To Inspire One United Nation to Believe...**

**IDENTITY** | How we are committed to playing for this team  
**Pride, Self Commitment, Performance, Leadership, Respect**

**WIN!** | Clarity in what we are playing for  
**Deliver four world class athletes to Tokyo 2020 in personal best form while living our performance culture**

**Plan** | Trust that the players can deliver the plan  
**Deliver our Critical Elements:**  
 +The Talent Pathway (Identification, transfer, women, team sprints)  
 +Our Physical Performance Plan (Individual plans, model determinants, monitoring)  
 +Our Performance Culture (Communication, purpose, values, accountability)  
 +Our Aero (Investment, Innovation, aerodynamics, position, suits, bikes, bars, wheels...)  
 +The Legacy Plan (Knowledge transfer, leadership, Azizul, coaching succession)

## Equipment & Aerodynamic



### SKINSUIT



- 50,000+ materials and speed combination tested
- Probably the most important of all the equipment.
- Significant gains over existing skinsuit.
- Custom fit and technology being sold under the VORTEQ brand.

### TRACK BIKE



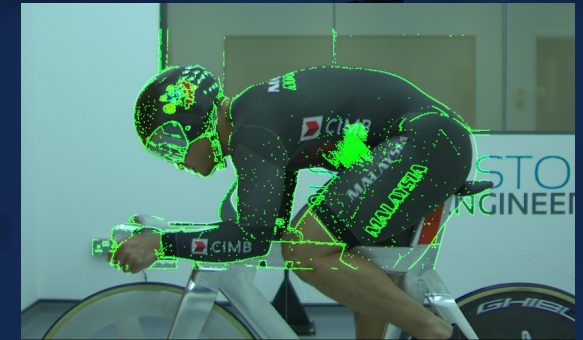
- Lighter, stiffer and more aerodynamic.
- Sintered Titanium lugs and custom carbon fibre tubing.
- Integrated saddle.
- Integrated handlebars and stem.
- Narrow front fork.
- Achieved significant aerodynamic improvements, >20% drag reduction from bike only drag.

### WHEEL



- Significantly more aerodynamic 26% less power required than the current wheel.
- Significantly lighter, probably >20% weight saving.
- Stiffness is expected to be at least as good, but will be tested next week.
- ~100 different profiles of the rim were tested in CFD.
- FEA analysis to ensure stiffness/weight ratio is maximal.

### POSITIONING



- Good development of body position.
- Significant aero gains.
- Enhancing rider's awareness & knowledge

P2020: Outcome



World Championship 2020, Berlin



Olympic Tokyo 2020



1km Time Trial Asia Record / World Number 1



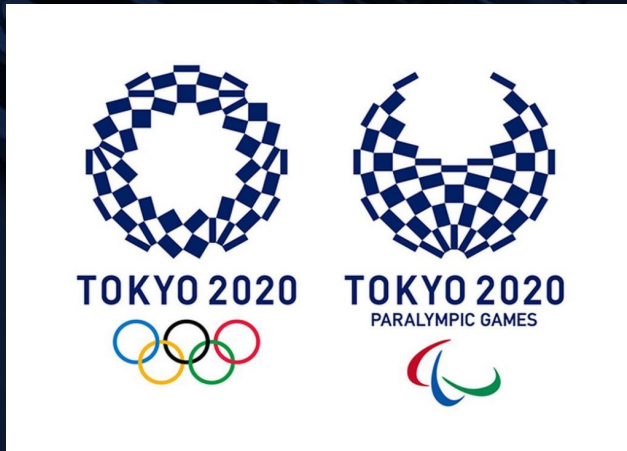
Asian Games 2018





**OUR JOURNEY**

2021



2024



Post Tokyo 2020  
RM10 million grant approved by the Malaysian government to pursue R&D and innovation projects in high potential Olympic/Paralympic sports. This initiative underscores Malaysia's commitment to drive performance innovation in our sporting ecosystem



WXR Track Bicycle: Paris Edition

Improve aerodynamic and cycling efficiency - new frame, wheel, crank.



3D printed grip for archery

Customised with better materials – to enhance stability and precision

**P2024: Outcome**



**ISN**

2017-2020



2020-2024



Technology transfer & partnership with local companies  
(commercialisation)



**BOZETTA**





National Sports Institute (NSI) chief executive officer Ahmad Faedzal Md Ramli (File photo)

**SPORTS**

## **ISN Explores AI To Drive Sports Transformation In Malaysia**

20/11/2024 08:06 PM

**By Amiril Muttaqien Meketar and Muhammad Zulkarnain Mohd Azman**

KUALA LUMPUR, Nov 17 (Bernama) -- The advancement of sports science, medicine and technology in Malaysia would not be possible without the solid reputation of the National Sports Institute (ISN).

Since its establishment in 2011, the agency under the Ministry of Youth and Sports (KBS) has played a crucial role in developing grassroots athletes to become world-class through its specialised sports science technology services.



**Giant calibration wall**

- Portable/Movable
- Covers up to 10m height
- Line for every 1m serve as height indicator
- Each dive to be measured quantitatively either by coach/camera
- For eg. Take off height, rotation completion height

**TV/Monitor/Screen**

- Touch screen
- Multi camera views on screen
- Delayed video playback on pool deck
- Frame by frame playback

**Mini PC for system database**

- Artificial intelligence-powered coaching system
- Estimate athletes' posture in 3D
- Record the continuous key movements

**Underwater camera**

- Automatic subject tracking

**AI tracking system**

- Multi camera set up
- Automatic subject tracking
- Smart switch to semi underwater camera
- Camera dedicated to 10m
- Camera dedicated to 3m
- Camera for overall view

## AI-Based System

Real-time feedback on diving technique, including body alignment, entry angle, and splash minimization.

artificial intelligence | 3D Functional Screening System

assessment management > assessment

recorded video participant: Ali Abu Bakar

**movement analysis**

position angle

COG joint

Assessment Module Selection

Deep Squat

## AI-Based System

Injury screening & injury management

Draft UI Visualization and Key Features

AI Tagging/Manual Tagging

Player Stats

Adding Media Source

Main Scene

Switchable Scene

2D Birds Eye View

UI Controls for Trigger Rec

UI Controls



AI-tracking system for field hockey

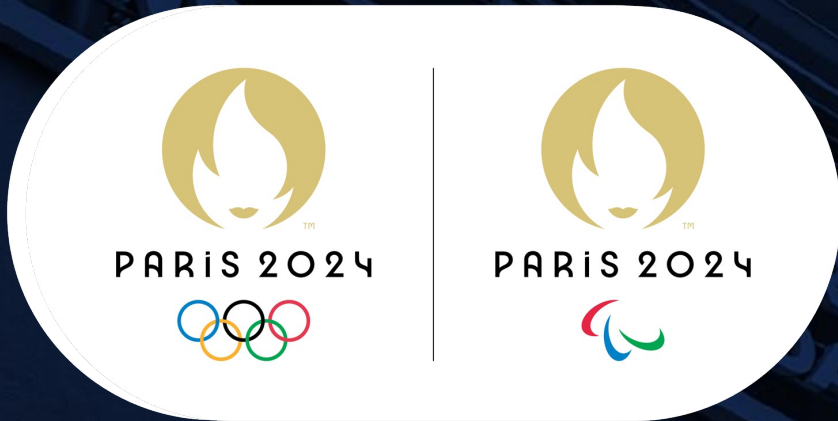
To help capture and analyse data from matches faster and more accurate, hence assisting coaches in decision making





## OUR JOURNEY

2024



2028



Post Paris 2024  
ISN was again given the trust by the Malaysian government to further drive performance innovation and technology initiatives towards preparation for LA28 through a RM15 million funding for the 2025-2028 period.



The Sports Ministry today announced a new high performance preparation programme for elite athletes, Road to Gold (RTG), which will cover two Olympic cycles and feature a much more inclusive committee compared to its predecessors. - NSTP/OWEE AH CHUN

KUALA LUMPUR: The Sports Ministry today announced a new high performance preparation programme for elite athletes, Road to Gold (RTG), which will cover two Olympic cycles and feature a much more inclusive committee compared to its predecessors.

Unlike previous programmes such as Road to Rio and Road to Tokyo which only covered one Olympic cycle, RTG is intended to provide cream-of-the-crop athletes the support they need to challenge for gold at both the Paris Olympics next year as well as Los Angeles 2028.

## ‘Yet to succeed’: Malaysia sports minister apologises for zero gold medals at Paris Olympics

With its 15 medals across silver and bronze, Malaysia is the most successful country without a gold at the Olympic Games over the years.



14 Aug 2024 12:28PM  
(Updated: 14 Aug 2024 12:28PM)



# ISN'S ROLE IN DRIVING SPORTS TECHNOLOGY ECOSYSTEM IN MALAYSIA



2017



2021

## CENTER OF EXCELLENCE

- **Driving innovation, research & development and accelerate adoption of technology into the industry through commercialization.**

- *Research and Development*
- *Technology Evaluation and Testing*
- *Collaboration and Partnerships*
- *Standards and Best Practices*
- *Education and Training*
- *Incubators and Accelerators*
- *Showcasing and Demonstrations*

## SANDBOX

- **A technology sandbox is an isolated space where researchers, innovators and developers can experiment, innovate, validate and test new ideas, technologies and innovations in a safe and controlled environment.**

**1****SPORTS TECHNOLOGY R&D PROGRAM**

- Product development for athlete performance enhancement
- Product development for Commercialisation

**2****SPORTS START UP ASSISTANCE**

- Assisting Sports Start-up for commercialisation
- Linkage with STI agencies
- Programs Linkages

**3****INDUSTRY MATCHING**

- Matching industries for commercialisation
- Matching industries with in-field experts
- Matching academia R&D with industries

**4****BRAND ENHANCEMENT**

- Enhancing local brands and products through partnership
- Intellectual properties licensing

**5****FUNDS & GRANTS MATCHING**

- Matching industry products with commercialisation funds
- Funds & grants database
- Venture Capitals & Angel Investors linkage

**6****SPORTS INNOVATION AWARENESS PROGRAM**

- Sports Innovation Industry Conferences & Symposiums
- Awards & Recognitions
- Sports Innovation Competitions

**7****GLOBAL INITIATIVES**

- International Program Linkage (**Real Madrid Accelerator, Taiwan Sports Accelerator, India Start-up Summit**)
- International Industry Collaborations (**Japan, Korea, Indonesia**)
- International Institute Partnerships (**MIT, Tsukuba**)

**8****SPORTS TECHNOLOGY SANDBOX**

- Validation & testing sites and labs
- Sandbox Support

**SPORTS TECHNOLOGY CENTRES**

UNIVERSITI MALAYSIA PERLIS  
**SER**  
SPORTS ENGINEERING RESEARCH CENTRE




*Human Engineering Group*

**SITC**  
SPORTS INNOVATION AND TECHNOLOGY CENTRE



**SEA-IC**  
SPORTS ENGINEERING AND ARTIFICIAL INTELLIGENCE CENTRE

**SPEAR**  
Sports Engineering Advance Research



Innovative Manufacturing,  
Mechatronics & Sports  
Laboratory



**UiTM**



**UniMAP**



**UTM**



**CURTIN SARAWAK**





# WXR Track Bike & BOZETTA Road Bike

# INNOVATION EXAMPLES



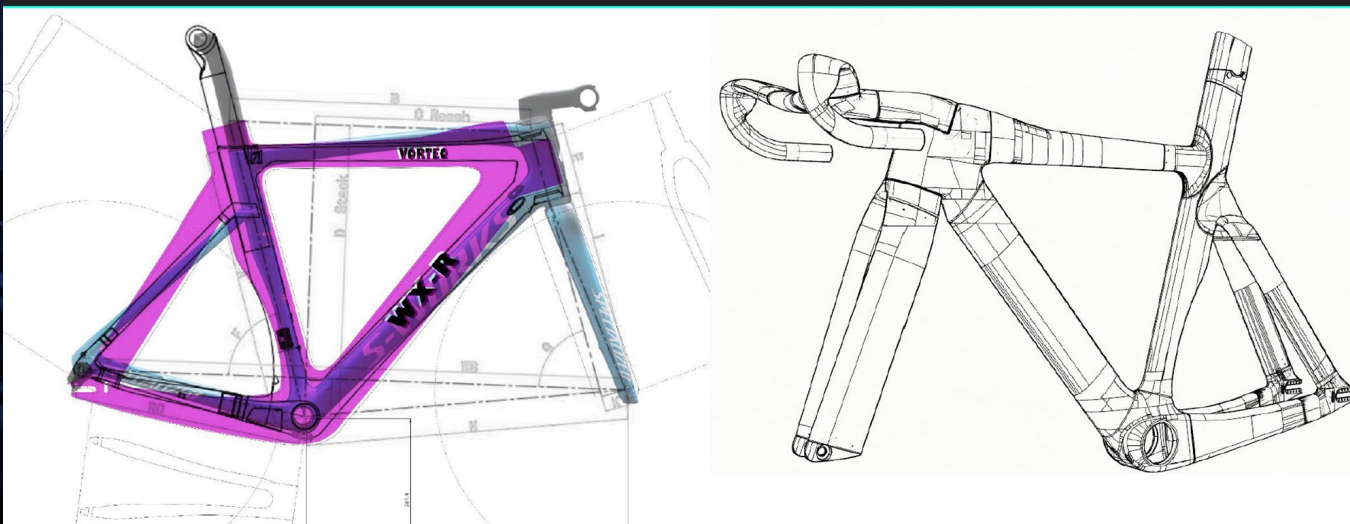
■ WX-R ■ BOZ ■ S-WORKS



THE INSPIRATION

WX-R VORTEQ By ISN

USED by DATO AZIZUL HASNI AWANG  
OLYMPIC SILVER MEDALLIST, TOKYO 2020  
OLYMPIC BRONZE MEDALLIST, RIO 2016



## A STRATEGIC COLLABORATIVE PROJECT



Institut Sukan Negara  
Research Institute



MAJLIS REKABENTUK MALAYSIA

Government Related Agency  
Under MITI



BOZETTA

Industrial and Technology Design  
Specialist

Exclusive Distributor

NFC Partner







# AGILEMAS

## Unified Digital Platform for Sports

# INNOVATION

## EXAMPLES

AgileMAS Home About League Management System [Go to App](#)

### National Sports Unified Digital Platform

From the world's biggest competitions to your high school football team, AgileMAS empowers the future of sports!

Whether you're a league, a team, or an athlete, AgileMAS delivers the tools sports organisations need to merge content, commerce and community to form the ultimate sports experience.

[Learn More](#)

### KULSOCS

#### UV Protected & Anti Bacteria Hand Socks

AgileMAS Search Athletes, Teams or Leagues... [Contact Us](#) [Need Help? Click Here](#) [Log In](#) [Sign Up](#)

- App
- News
- TV
- Sports

**AgileMAS Browse**

- Sports Analytics
- Active Lifestyle
- E-Learning
- Marketplace

**Most Viewed Video**

<p><b>BPJKB JSJ/PGRSN STADIUM MBS</b></p> <p>24 FEBRUARI 2023 - 9 MALAM - JUMAAT</p> <p>1 Hour 42 min</p> <p>(LIVE) FULL MATCH : KARA UNITED vs BUKIT BINTANG FC</p> <p>Saturday, March 11 10:16PM - 11:58PM</p> <p>Football Live</p>	<p><b>KL City FC vs Kuala Lumpur</b></p> <p>2 Hour 30 min</p> <p>[HIGHLIGHT MPFL23]</p> <p>Saturday, June 10 08:30PM - 11:00PM</p> <p>Football Live</p>	<p><b>MY SUKAN BYTES</b></p> <p>1 Hour 25 min</p> <p>ASIA PACIFIC INVITATIONAL 2023</p> <p>Saturday, May 27 10:21AM - 11:46AM</p> <p>Football Ended</p>	<p><b>BPJKB JSJ/PGRSN STADIUM MBS</b></p> <p>24 FEBRUARI 2023 - 9 MALAM - JUMAAT</p> <p>1 Hour 20 min</p> <p>Matchweek #2 RU FC vs AFC CBY</p> <p>Saturday, April 8 10:14PM - 11:34PM</p> <p>Football Live</p>	<p><b>LIGA REMA UNITED 0-4</b></p> <p>Monday, March 13 10:14PM - 11:34PM</p> <p>Football Live</p>
---	---	---	--	---

**Most Viewed Events**

[Join AgileMAS Community](#)

**KULSOCS**

Kulsocs KULSOCS x ISN



## AI3D CAMS

Supported By:

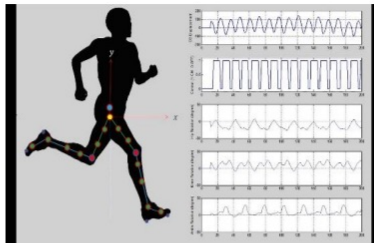


### Sport E-profiling using Ai3D-CAMS

The Next Generation to Automate 3D Joint Data Collection for Performance Analysis and Enhancement in the field of High-Performance Sport

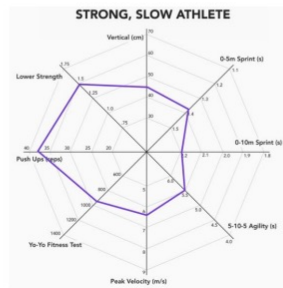
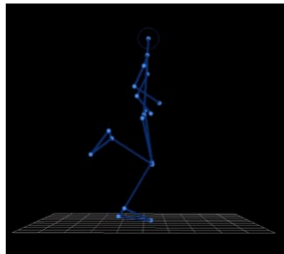
#Malaysian Utility Innovation  
#UI 2022001881

3D human point clouds  
-Remove occlusion issue that faced by 2D imaging



Joints kinematic graph  
-Temporal motion and joint analysis

Skeleton-like joints display  
-Precisely locate human joints on 3D space



Personalize athlete E-profile  
- Performance analysis

## INNOVATION EXAMPLES

### STEADY PULL SPORTS Tug-Of-War Footwear



**INNOVATION  
EXAMPLES**



**RevelDNA DNA Kit & Genomic Services**



**ATF Healing Boots**



## BS NUTRITION Whey Protein (ISN Formulated)



## OPSTAR PROTEIN INDUSTRIES (OPI) Coconut Infused Energy Drink & Hydration Drink

**OPI**  
OPTASTAR PROTEIN INDUSTRIES

**1<sup>ST</sup> MALAYSIA  
READY TO DRINK  
PROTEIN DRINK**

OPI PROTEIN WATER membekalkan sumber protein yang tinggi iaitu

16g Protein/ Setiap Hidangan  
3.5 Branch-Chain Asid Amino (BCAA)

- Sokongan Otot Muscle Support
- Pemulihan Recovery
- BCAA
- Energy Booster
- Diet
- Sugar Free



## iDERIA A.I. Based Performance Analysis



## INNOVATION EXAMPLES

## RINEU: 16PERCENT Active Lifestyle Skincare Products

YOUR SKIN.  
YOUR BEAUTY.

**16PERCENT**

YOUR SKIN.  
YOUR BEAUTY.



# ISN SPORTS TECHNOLOGY & INNOVATION ARTIFICIAL INTELLIGENCE PROJECTS

## Ai SportsMAS

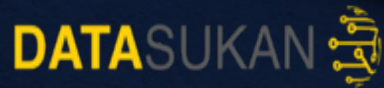
AI based football stats collection

HOCKEY INTELLIGENT TACTICAL SYSTEM

PORTABLE MOTION CAPTURE SYSTEM

TALENT UNITY ON INTELLIGENT PLATFORM FOR SPORTS (TULIPS)

AUTOMATED TACTICAL ANALYSIS FOR BADMINTON



MONASH University



**COMING SOON** **COMING SOON** **COMING SOON** **COMING SOON** **COMING SOON**


**AI BASED RACKET SPORTS  
PREDICTIVE ANALYSIS**

**KINEMATICS TO GROUND  
REACTION FORCE  
ESTIMATION USING DEEP  
LEARNING APPROACH**



f @ t v | [isnmalaysia](http://isnmalaysia)




   
KEMENTERIAN SAINS, TEKNOLOGI DAN INOVASI  
MINISTRY OF SCIENCE, TECHNOLOGY AND INNOVATION

# Anugerah Inovasi Teknologi Sukan Kebangsaan 2023



AIT'S'23

Layari  
[www.isn.gov.my/aits](http://www.isn.gov.my/aits)  
Tarikh Tutup Penyertaan : 15 Oktober 2023



Kerjasama







# SPORTS TECHNOLOGY AWARENESS PROGRAM

THE 1<sup>ST</sup> REVEALDNA INTERNATIONAL CONFERENCE ON INNOVATION AND TECHNOLOGY IN SPORTS

## 1<sup>ST</sup> REVEALDNA ICITS 2022

14 & 15 November 2022

National Sports Institute of Malaysia  
Bukit Jalil  
Kuala Lumpur, Malaysia

ICITS 2022 covers the following topics (but not limited to):

- Sports Instrumentation
- Sports Materials
- Sports Biomechanics
- Sports Equipment Design
- Simulation in Sports
- Data Analytics in Sports
- Performance Analysis

Accepted submissions will be published in Lecture Notes in Bioengineering, a Scopus-indexed proceedings published by Springer.

Co-organised by



Sponsors



<https://mysta.org.my/icits>

## ICITS'23

### REVEAL

2<sup>ND</sup> INTERNATIONAL CONFERENCE ON INNOVATION AND TECHNOLOGY IN SPORTS

27 & 28 NOVEMBER 2023

National Sports Institute of Malaysia  
Bukit Jalil  
Kuala Lumpur

ICITS 2023 covers the following topics (but not limited to):

- Sports Instrumentation
- Sports Materials
- Sports Biomechanics
- Sports Equipment
- Design Simulation in Sports
- Data Analytics in Sports
- Performance Analysis

Accepted submissions will be published in a Scopus Indexed proceedings

Co-organised by



Sponsors



[icits.my/2023](https://icits.my/2023)



## PERFORM

ICITS 2024 X ASSB 2024

13, 14 & 15 December

@ National Sports Institute of Malaysia, Bukit Jalil, Kuala Lumpur

3<sup>RD</sup> INTERNATIONAL CONFERENCE ON INNOVATION AND TECHNOLOGY IN SPORTS & 10<sup>TH</sup> ASIAN SOCIETY OF SPORT BIOMECHANICS CONFERENCE

## 2024

TOPICS (but not limited to)

- Sports Biomechanics
- Design & Simulation in Sports
- Data Analytics in Sports
- Coaching Innovation
- Sports Medicine Advancement
- Advance Material in Sports
- Sports Rehabilitation & Injury Prevention
- Sports Instrumentation & Equipment
- Performance & Motion Analysis

CO-ORGANISED BY



Sponsors



Supporters:



Syed Omar Hassan Casson, Godfrey Abdul Majeed Editors



Innovation and Technology in Sports

Lecture Notes in Bioengineering

Syed Faris Syed Omar · Mohd Hasnun Arif Hassan · Alexander Casson · Alan Godfrey · Anwar P.P. Abdul Majeed *Editors*

# Innovation and Technology in Sports

Proceedings of the International Conference on Innovation and Technology in Sports, (ICITS) 2022, Malaysia

Springer



MAJALAH TEKNOLOGI SUKAN

# GAME CHANGER

Waktu Tayangan 13 episod:

11-11.3am | **RABU** | mulai 6 Sep

di saluran sukan RTM

<https://rtmklik.rtm.gov.my/live/sukanrtm>

akan diulang siar apabila selepas 13 episod pertama selesai

UNIVERSITI MALAYSIA PERLIS **SERC** PERFORMANCE TECHNOLOGY COMPUTING AND DATA GROUP

UNIVERSITI MALAYSIA PERLIS **UniMAP**

MYSTRA MANUFACTURING TECHNOLOGY RESEARCH AFFILIATION

## SERC - MySTA Sports Technology Symposium

27 January, 2023 (Friday)  
08:00 AM - 05:00 PM  
TUANKU SYED FAIZUDDIN  
PUTRA LIBRARY AUDITORIUM,  
UniMAP



**REGISTER NOW**

**Dr. Mohd Hasnun Arif Bin Hassan**  
Presiden MySTA  
"Introduction of MySTA & Current Trends in Sports Technology Research"

**Syed Faris Syed Omar**  
Head, Industry and Technology Transfer  
National Sports Institute of Malaysia (ISN)  
"Malaysia Scenario of Sports Tech Research - Role of ISN"

**Assoc Prof Ts Dr Zulkifli Mohamed**  
Head of Sports Engineering & Artificial Intelligence Centre (SEA-IC), UiTM  
"Sports Technology: Challenges & Opportunities"

**Assoc. Prof. Dr Mohd Zamani bin Ngali**  
Dept. of Mechanical Engineering,  
Faculty of Mechanical and Manufacturing Engineering, UTHM  
"AI in sports performance analytics"

**FREE REGISTRATION**

All are invited. E-certificate will be given



TEAM MAS



WHERE  
**SPORT**  
MEETS  
**SCIENCE**

**THANK YOU**

INSTITUT SAINS  
GARA

WHERE  
MEETS