

# 2018 FAI DRONE YEARBOOK



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# TABLE OF CONTENTS

## SPEED, PASSION AND CAMARADERIE: FAI DRONE RACING 2018

THE TRIUMPH AND THE HEARTBREAK	I
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## 2018 FAI WORLD DRONE RACING CHAMPIONSHIPS

WELCOME TO SHENZHEN!	9
INTERNATIONAL SHOWDOWN	13
OVERALL CHAMPION - RUDI BROWNING	15
FEMALE CHAMPION - WANRAYA WANNAPONG	17
JUNIOR CHAMPION - OSCAR NILSSON	18
TEAM CHAMPION - TEAM AUSTRALIA	19
STRAIGHT LINE RACING WINNER - TIMOTHY TROWBRIDGE	20
THE COMPETITION	21
STRAIGHT LINE RACING	25
AN AIR SPORT FOR ALL	27
TECHNOLOGY	33
BEHIND THE SCENES	37

## 2018 FAI DRONE RACING WORLD CUP

MAP OF THE 2018 FAI DRONE RACING WORLD CUP	43
A SERIES OF WORLD-CLASS COMPETITIONS	45
WORLD CUP WINNER - KILLIAN ROUSSEAU	47
THE COMPETITION	49
RULES	51

## DEEPER INTO DRONES

WHAT IS DRONE RACING?	55
2018 FAI INTERNATIONAL DRONES CONFERENCE & EXPO	58



# SPEED, PASSION AND CAMARADERIE: FAI DRONE RACING 2018

## THE TRIUMPH AND THE HEARTBREAK

Jaw-dropping displays of speed and skill, euphoric victories, and devastating crashes... there's no doubt the year 2018 was the biggest and best yet for FAI drone sport.

A total of 128 world-class drone racers from 34 countries, including 44 Juniors and 13 Women, participated in the first ever FAI World Drone Racing Championships in Shenzhen, China.

Australian Junior pilot Rudi Browning was crowned the 2018 FAI World Drone Racing Overall Champion, with 11-year-old Wanraya Wannapong taking gold in the Women's classification, Sweden's Oscar Nilsson winning the Junior competition and the Team gold going to Australia.

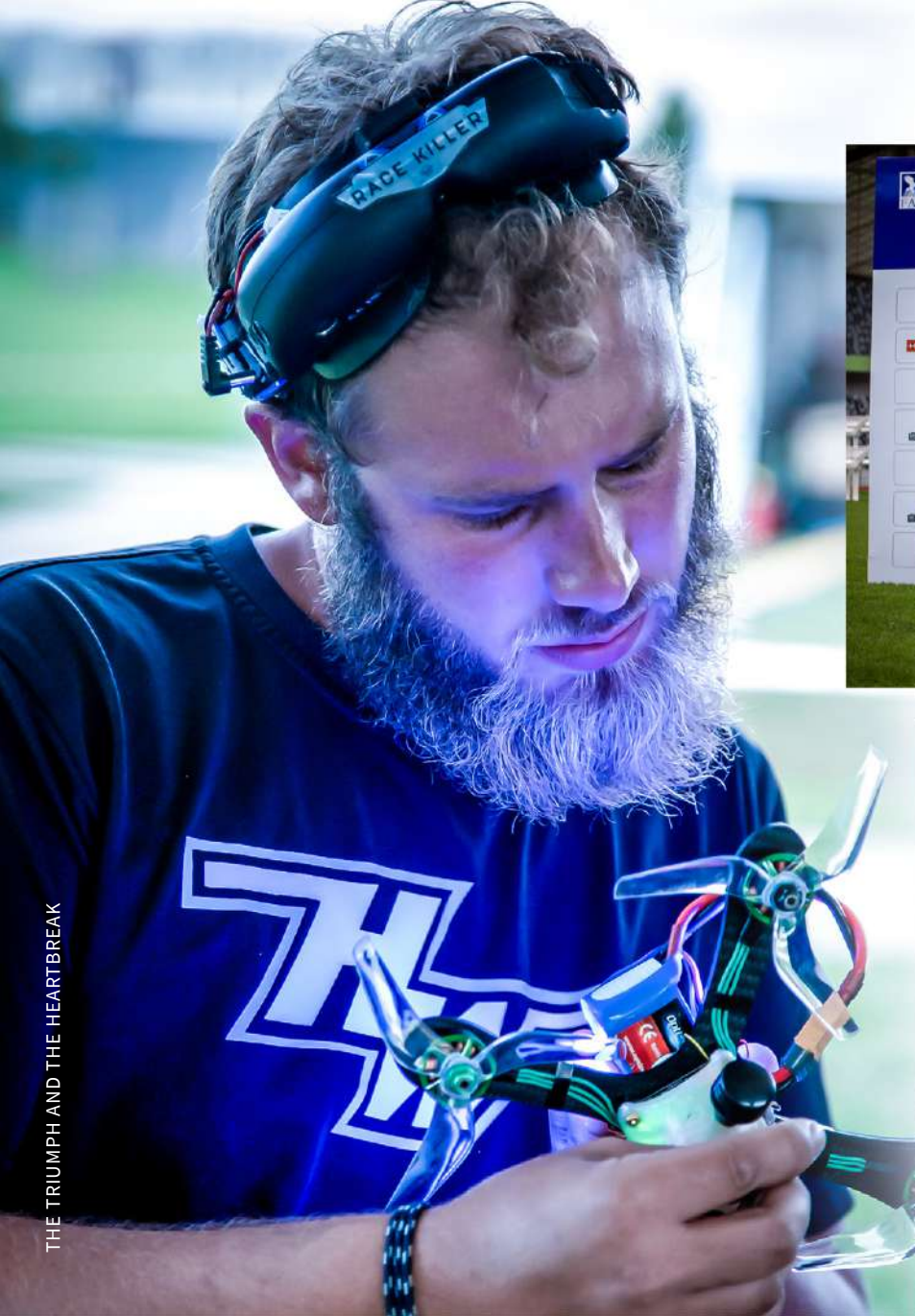




The 2018 edition of the FAI Drone Racing World Cup was also the biggest yet, involving a total of 669 pilots from 41 countries. With more than 20 competitions on the calendar, it was a rollercoaster ride of highs and lows for the talented pilots taking part. French Junior drone ace Killian Rousseau, 14, came out on top in the end, ahead of Poland's Jan Wielgosz, also a Junior, and David Spacek of Czech Republic.

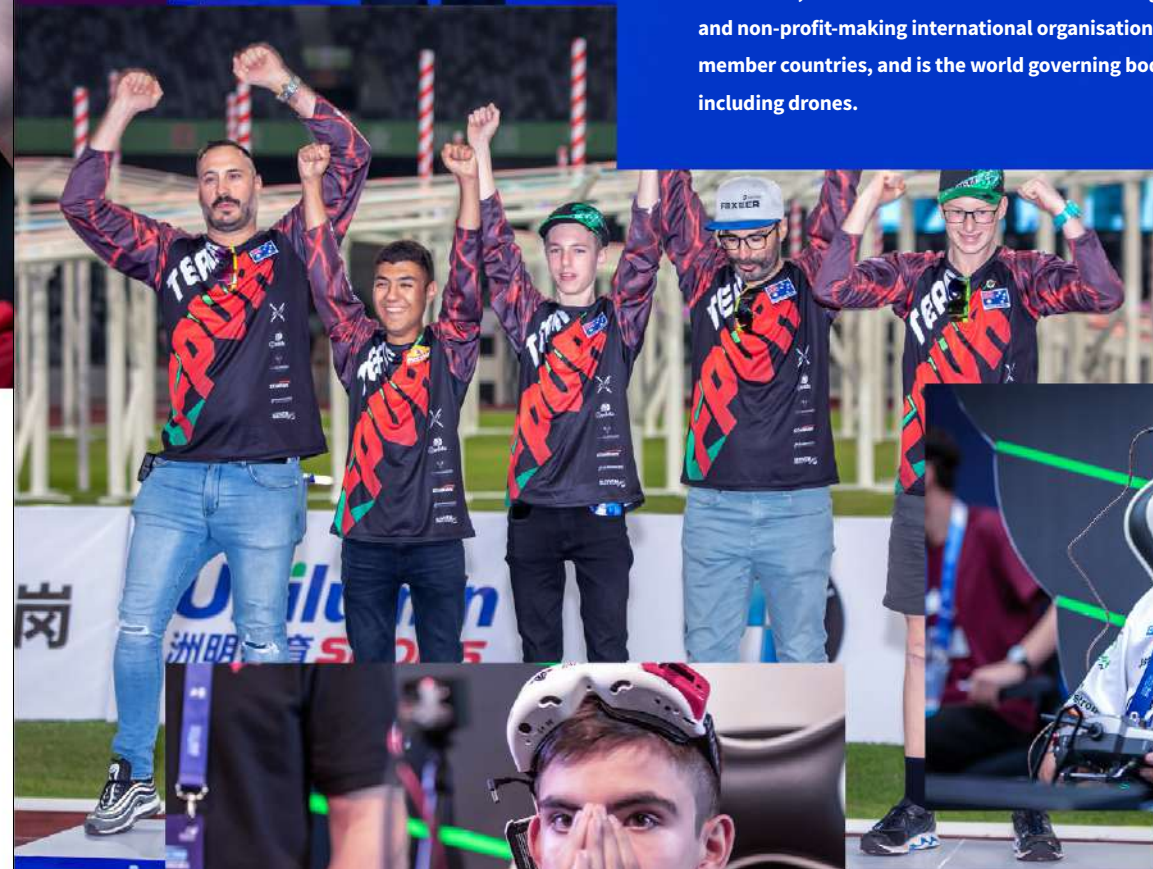






## FAI: AT THE HEART OF DRONE SPORTS

The Fédération Aéronautique Internationale, FAI – The World Air Sports Federation, was founded in 1905. It is an IOC-recognised, non-governmental and non-profit-making international organisation with more than 100 member countries, and is the world governing body for all air sports including drones.





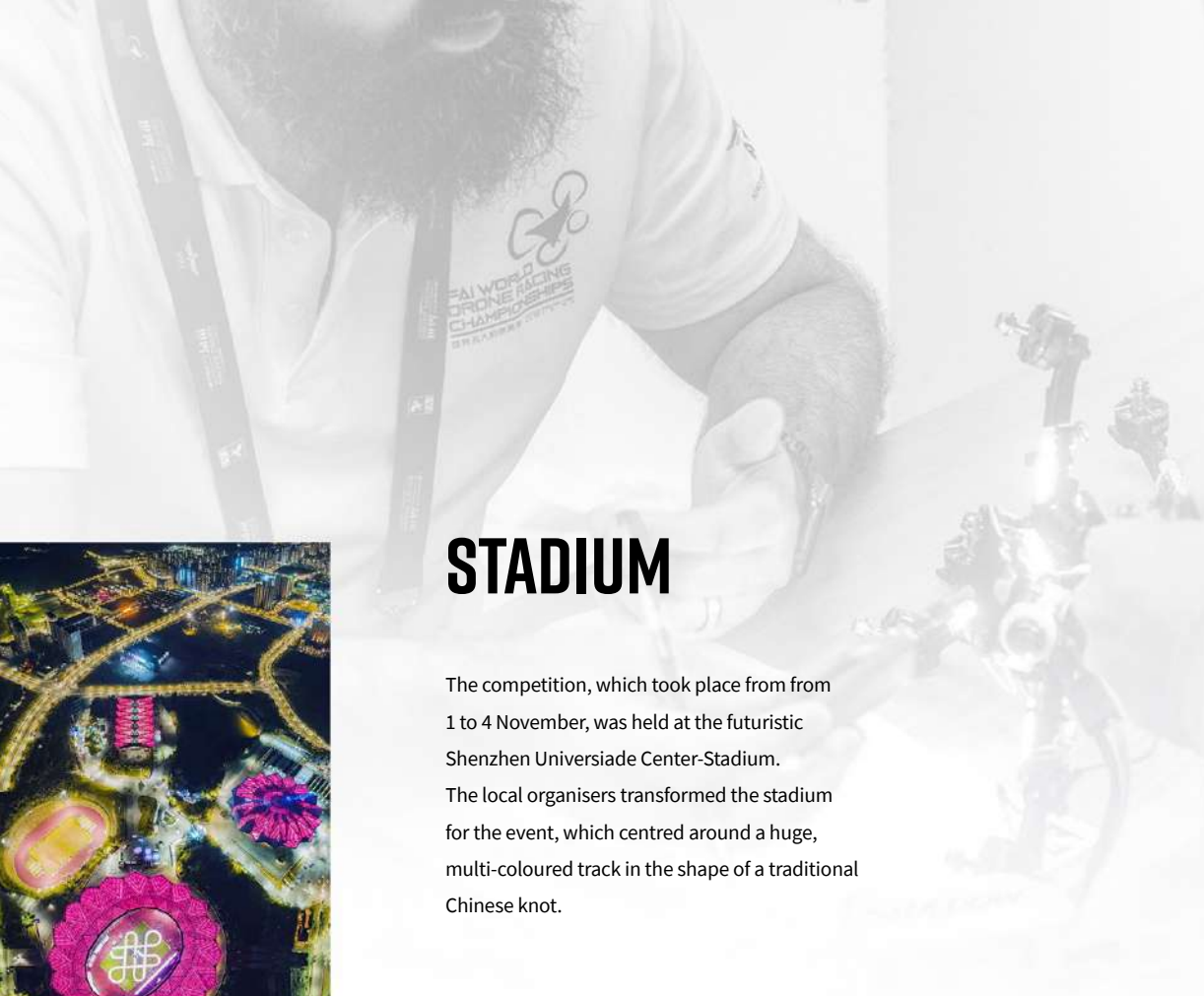


**FAI WORLD  
DRONE RACING  
CHAMPIONSHIPS**

世界无人机锦标赛 | 2018 SHENZHEN · CHINA  
中国 · 深圳

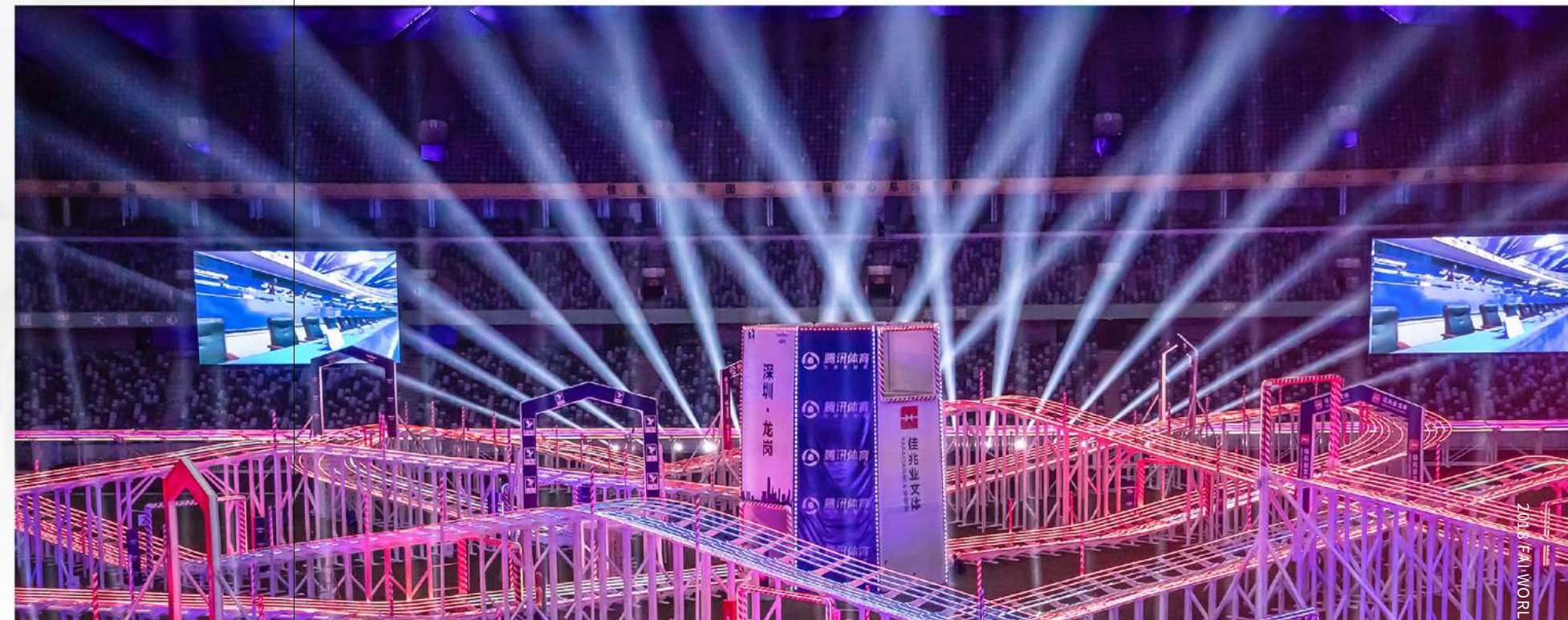
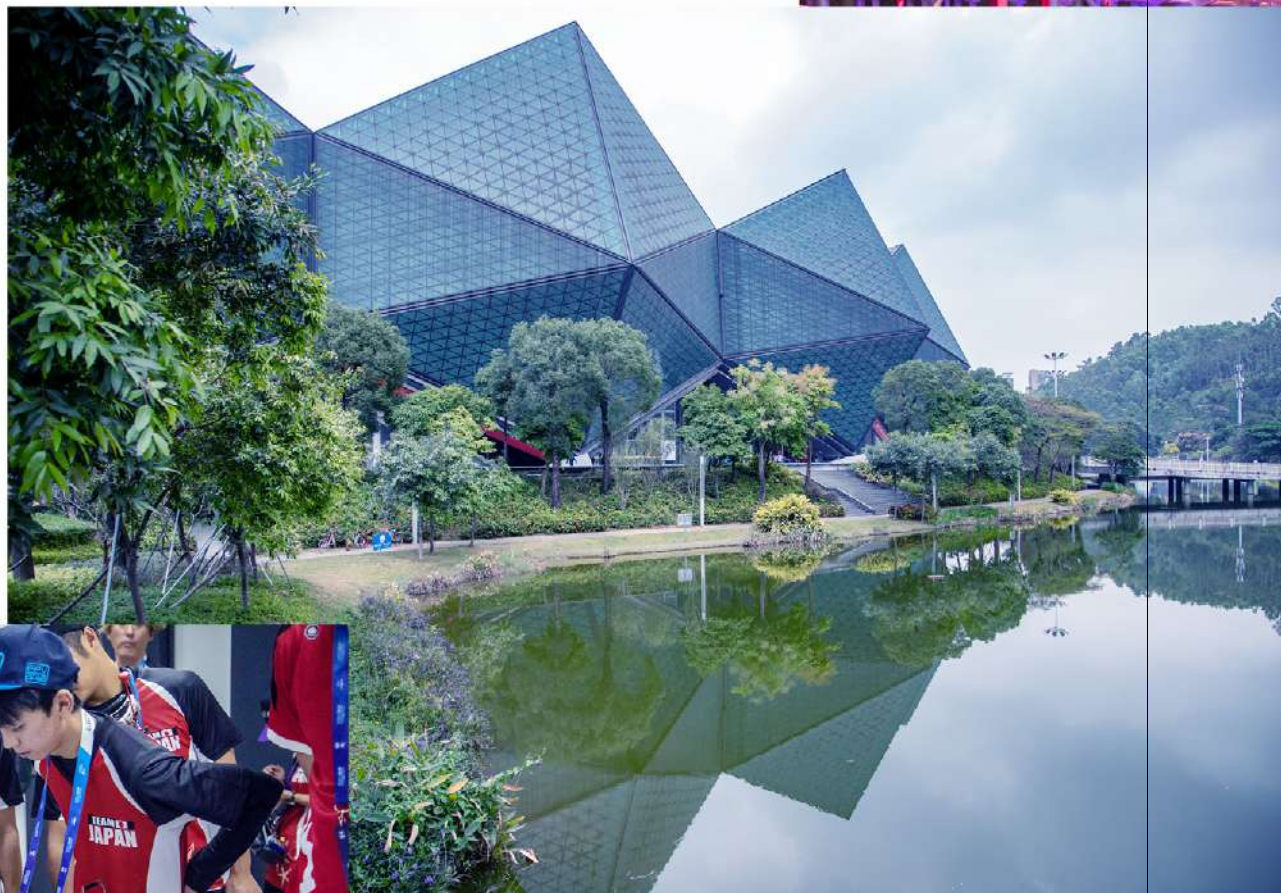
# 2018 FAI WORLD DRONE RACING CHAMPIONSHIPS





## STADIUM

The competition, which took place from from 1 to 4 November, was held at the futuristic Shenzhen Universiade Center-Stadium. The local organisers transformed the stadium for the event, which centred around a huge, multi-coloured track in the shape of a traditional Chinese knot.



## WELCOME TO SHENZHEN!

A total of 128 competitors, including 44 Juniors and 13 Women, descended on Shenzhen in Southern China for the inaugural edition of the FAI World Drone Racing Championships. They were supported by 34 team managers, 72 extra helpers and 56 official supporters.

## TRACK

Covered in 7,000m of LED lighting, the 650m race track was one of the biggest ever built for a drone racing competition.





# PLATON MAXIMOV

Russian Junior pilot Platon Maximov, 16, was a big fan. *“The track here is the best track I have ever seen,”* he said.

*“It is so amazing. It’s like a rollercoaster, up and down, left and right. It’s perfect, amazing. At night you have all the LEDs, and you follow the line of light.”*



## OPENING CEREMONY

The competition kicked off style with a spectacular Opening Ceremony featuring a mesmerising aerobatic show, a flag ceremony, and an impressive drone display.

Played out over several heats across four days, it culminated with the presentation of gold, silver and bronze medals in four categories: Overall; Women; Junior; and National Teams.

Alongside the main competition there was also a Straight Line Racing competition: a drag race of a straight 100m in which the first pilot over the finish line won, and had the chance to claim a new FAI world record for speed with a racing drone.





# INTERNATIONAL SHOWDOWN

Only the very best drone racing pilots from around the world made it to the FAI World Drone Racing Championships.

Representing 34 countries, they all had their sights set on one goal: to become the first ever FAI World Drone Racing Champion.



The People's Republic of China had one of the largest teams at the Championships.



The Hungarian team were delighted to be part of the event.



FAI Drone Racing World Cup winner Killian Rousseau carried the flag for the French team.



The Korean team was one of the strongest in the competition.



Israel and Italy were both represented.



Team Finland stood proudly behind their national flag.



1. Rudi Browning - Junior (AUS)
2. Bastian Hackl (AUT)
3. Karlis Gross (LAT)

# OVERALL CHAMPION RUDI BROWNING

Overall FAI World Drone Racing Champion 2018 Rudi Browning, 15, started drone racing in 2014, after taking up aeromodelling in 2010. The high school student from Brisbane beat 127 other drone racers from 34 countries to win the first ever FAI World Drone Racing Championships.

*"It feels absolutely amazing," he said afterwards. "I dreamed of this, and it is incredible that it has come true. I couldn't be happier."*

Browning beat three other drone pilots in a fast-paced and adrenaline-fuelled final. He finished ahead of Bastian Hackl from

Austria, who came in second and won silver, and Karlis Gross from Latvia who won bronze.

*"I am a very competitive person and I aim high," Browning added.*

*"The goal was to win everything I could. A lot of luck comes into it, as well as skill, so everything came together and I am super happy."*





# FEMALE CHAMPION - WANRAYA WANNAPONG

1. Wanraya Wannapong - Junior (THA)
2. GaYeon Mo - Junior (KOR)
3. Ting Yu Chao (TPE)

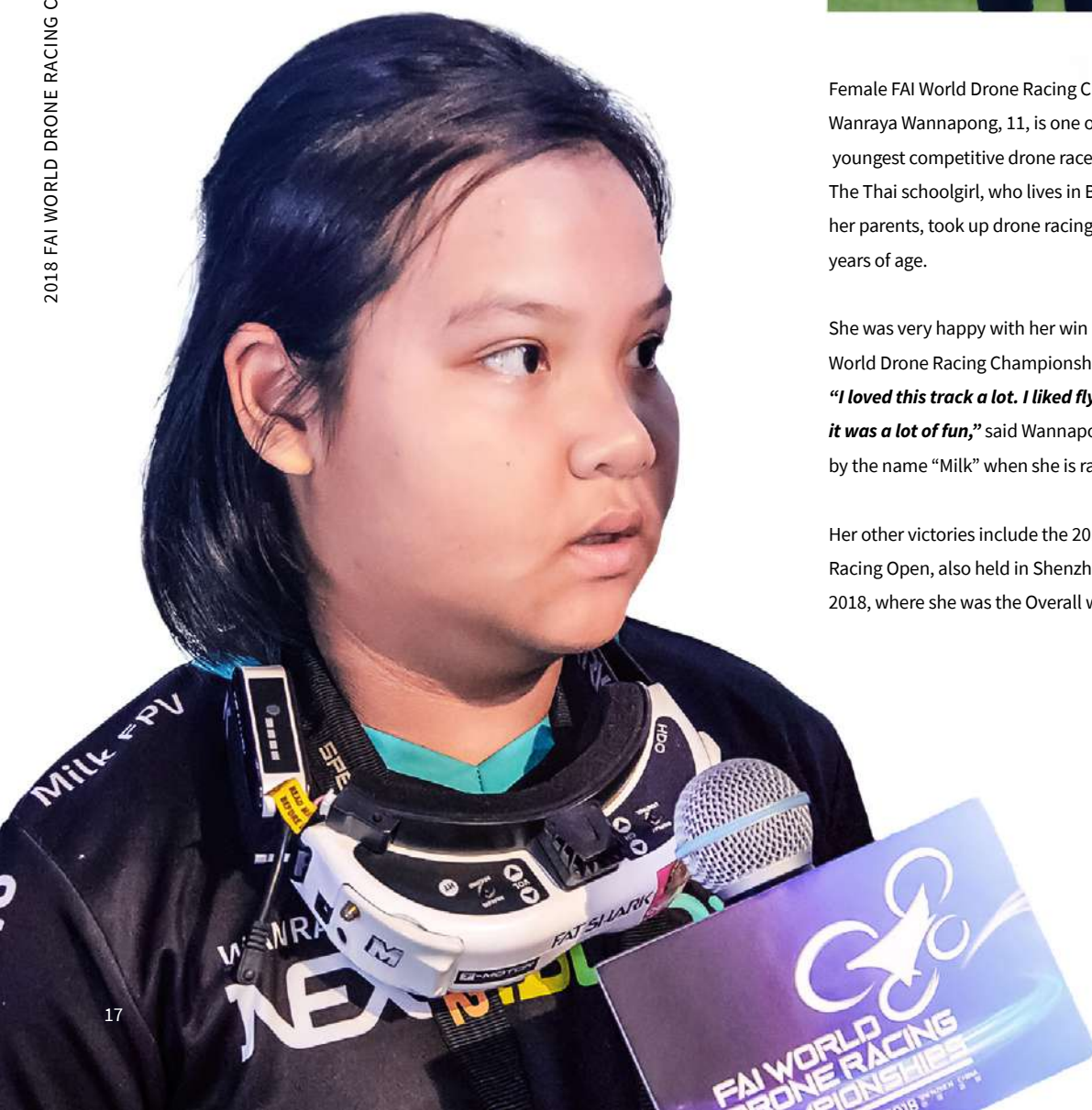


Female FAI World Drone Racing Champion 2018 Wanraya Wannapong, 11, is one of the youngest competitive drone racers in the world. The Thai schoolgirl, who lives in Bangkok with her parents, took up drone racing at just eight years of age.

She was very happy with her win at the 2018 FAI World Drone Racing Championships.

***"I loved this track a lot. I liked flying it at night, it was a lot of fun,"*** said Wannapong, who goes by the name "Milk" when she is racing.

Her other victories include the 2018 China Drone Racing Open, also held in Shenzhen in May 2018, where she was the Overall winner.



# JUNIOR CHAMPION - OSCAR NILSSON

1. Oscar Nilsson (SWE)
2. Qianti Hu (CHN)
3. Rudi Browning (AUS)

Junior FAI World Drone Racing Champion Oscar Nilsson, 18, took up drone racing in 2016. One of 44 Juniors in the competition, he was overjoyed with his win.

***"It feels really good,"*** he said afterwards.

***"I was aiming for an Overall win, but Junior is also really good. I want to thank my team for the support, and the Norwegian team. We came to China aiming to cooperate and it really worked out."***

When not drone racing, the young Swedish pilot also enjoys cycling and electronics.





Helped by Overall Champion Rudi Browning, Australia put in a fantastic performance to take home the gold medals in the Team event. Australian team manager David Crepaldi said: *"I'm very proud of the boys. The team pulled together and everyone played their part."* The Australian team was joined on the podium by Sweden in silver position Korea in bronze.

1. Australia
2. Sweden
3. Korea

# TEAM CHAMPION - TEAM AUSTRALIA



# STRAIGHT LINE RACING WINNER - TIMOTHY TROWBRIDGE

Switzerland's Timothy Trowbridge won the Straight Line Racing event at the FAI World Drone Racing Championships. He also set a new FAI world record for Speed Over a Straight Course of 50 m to 25 km with a drone, by hitting an average speed of 114.24km/h across two separate runs of a specially constructed 100m track.

*"It feels brilliant,"* he said after claiming his prize. *"The race was really cool and I am very proud to be bringing this record home for Switzerland. The launch is the most important thing in a race like this - when you get a good start you can just go full throttle all the way to the end."*



The FAI World Drone Racing Championships were split into three stages: Qualification, Elimination, and Finals.



# THE COMPETITION

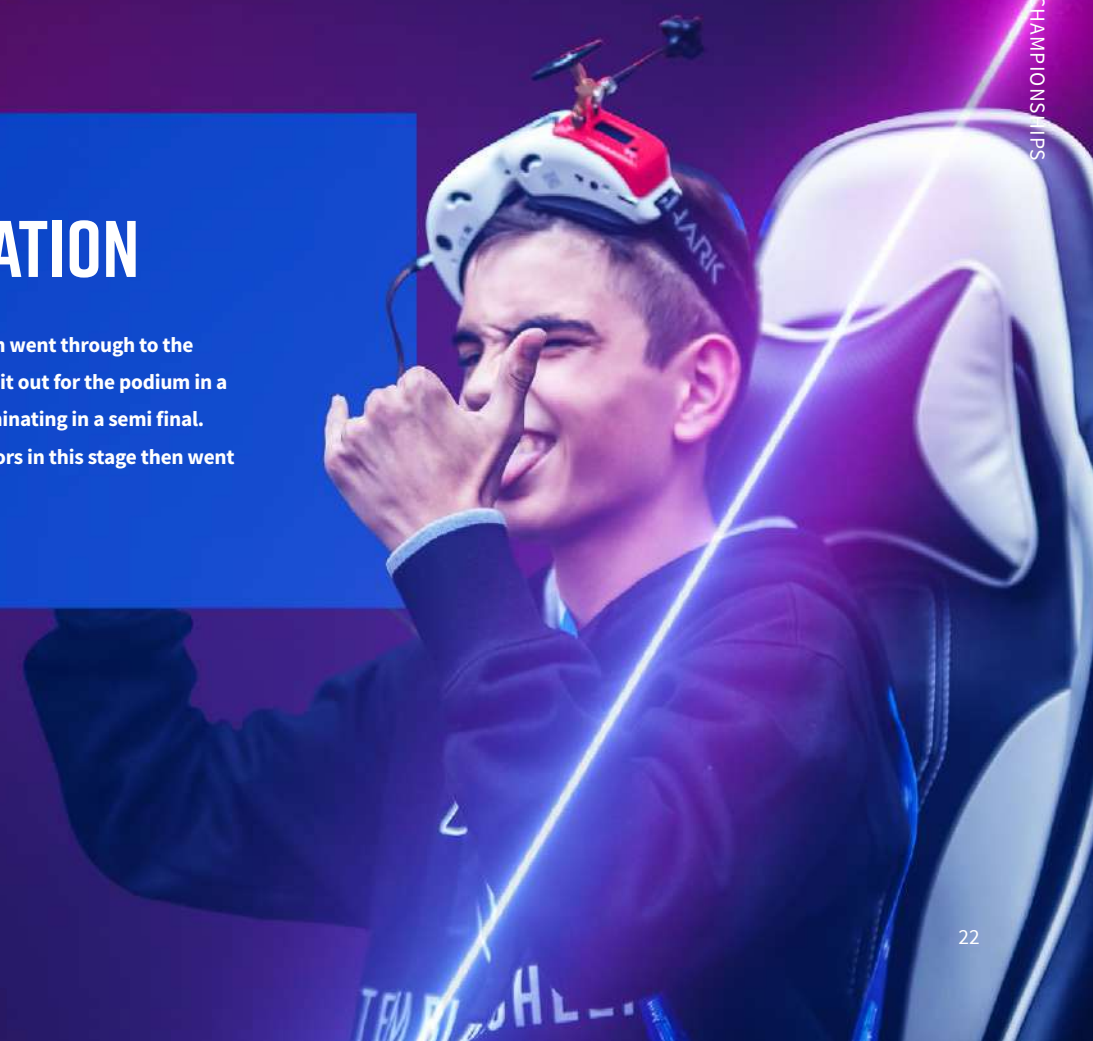
## QUALIFICATION

In each qualification round, each pilot had the possibility to fly three consecutive laps of the track, meaning they could fly a maximum of nine laps across the three qualification rounds. Their official times were then determined by taking the average of their best three lap times. Killian Rousseau, 14, a Junior competitor from France and winner of the 2018 FAI Drone Racing World Cup, was in the lead at the end of the qualification stage, with an average time of 24,75 seconds, representing an average speed of 94,6 km/h. After qualification, the top 64 pilots moved forward into the final competition rounds, which were live-streamed on YouTube, Facebook and Tencent television.



## ELIMINATION

The top 64 pilots then went through to the elimination, fighting it out for the podium in a series of rounds culminating in a semi final. The fastest competitors in this stage then went through to the finals.







## FINALS

The finals stage included three finals: one for the Women classification, one for the Junior classification and one for the Overall classification. The climax was a fast-paced, high-tension Overall final to decide the new FAI World Drone Racing Champion!





# STRAIGHT LINE RACING

**The winner set a new world record by hitting an average speed of 114.24 km/h over two runs.**

Swiss pilot Timothy Trowbridge triumphed in the Straight Line Racing event - the first of its kind anywhere in the world. He also set a new world record by hitting an average speed over two runs of 114.24km/h. The event took place on a straight 100m track, which was specially constructed at the Shenzhen Universiade Center-Stadium. A total of 62 pilots signed up to get the chance to become a world record holder and claim the \$3,000 cash prize.

The top four then took part in a final in which they raced in one direction before stopping, resetting and then racing back in the other direction, allowing judges to calculate their average time over two runs. FAI Aeromodelling Commission President Antonis Papadopoulos said: ***“We ran the final in this way because FAI rules state that pilots must fly in both directions when they are participating in a world record attempt.”***





# AN AIR SPORT FOR ALL

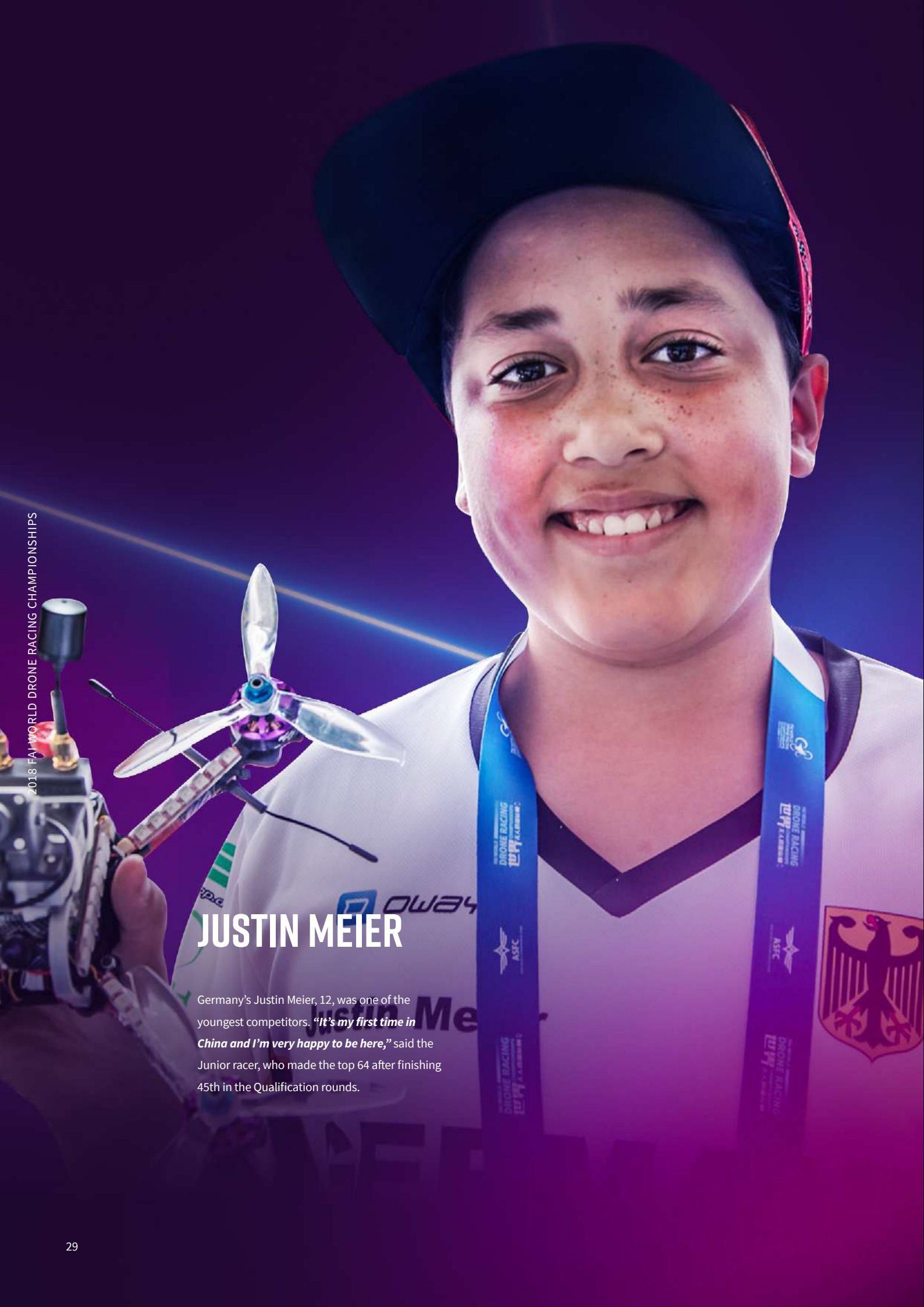
Drone racing is one air sport that truly anyone can enjoy, which is one of the reasons it's one of the fastest growing FAI sports in the world today.

It's extremely popular with young people; teenagers combining their love of online gaming and their skills in science and technology with the thrill of competition and sport.

In fact, the junior competitors often do better than the adults!

At the FAI World Drone Racing Championships, 44 of the pilots were Juniors, and one won the Overall event.





## JUSTIN MEIER

Germany's Justin Meier, 12, was one of the youngest competitors. *"It's my first time in China and I'm very happy to be here,"* said the Junior racer, who made the top 64 after finishing 45th in the Qualification rounds.



## MICHAEL ZAFIROV

Also taking part in the Junior event was 15-year-old Michael Zafirov from Hong Kong. *"I think the reason Juniors are so good is because of the learning curve. They race up that learning curve. If you give them a quad and enough batteries they just practice and get good really fast,"* he said.





## ZHI YING SAW

A total of 13 female pilots also competed in the FAI World Drone Racing Championships. They included Zhi Ying Saw (Jinny), who started racing in 2016 and was on the Malaysian team.

*"I think girls can excel in drone racing because the movements are very small so you have to be very precise,"* she said.

## LUISA RIZZO

Italian pilot Luisa Rizzo was also taking part in the Women's event. The 16-year-old wheelchair user from Lecce in Southern Italy said drone racing gave her a sense of freedom she had never felt before.

*"Getting involved with drone racing has changed my life in lots of ways,"* she said.

*"Even though I can't move, I can fly. Drone racing makes me feel free!"*



## ISABEL VILA ROURA

Deaf Spanish pilot Isabel Vila Roura agreed that drone racing is a great sport for people with disabilities because it allows them to compete on a level playing field with other pilots.

*"All I need is a helper to tap me on the shoulder when it is time to start, or if we need to stop,"* she said.

*"I can't hear if something is wrong with the propellers, but that is not a problem as I can feel and see the vibrations as the drone flies."*



# TECHNOLOGY

Drone racing is inextricably linked to electronics and technology. Unsurprisingly therefore, there's lots of cutting-edge technology at work behind the scenes at a drone racing event such as the FAI World Drone Racing Championships.



FAI Global Technical Partner Noosphere's eNavigator event management system was central to the success of the competition. The system's applications include creating event websites, integrating with FAI databases, receiving scores from external scoring systems and registering competitors.

Co-founded by Max Polyakov and Michael Ryabokon, Noosphere's mission is to unite scientists and researchers in order to promote science and technology.

The company's Chief Technical Officer Yuriy Letser said: ***"The eNavigator system's goal is to manage the entire event, starting from registering participants, then managing the website and online results. So we cover everything except the scoring."***



# TENCENT

Headquartered in Shenzhen, Chinese tech sector giant Tencent is an internet-based technology and cultural enterprise. A global pioneer of innovative, digital-based solutions, its mission is to provide platforms and services that connect everything.

At the FAI World Drone Racing Championships, Tencent was on hand to manage the livestream for Chinese television and internet fans all over the world.





## SIMULATOR

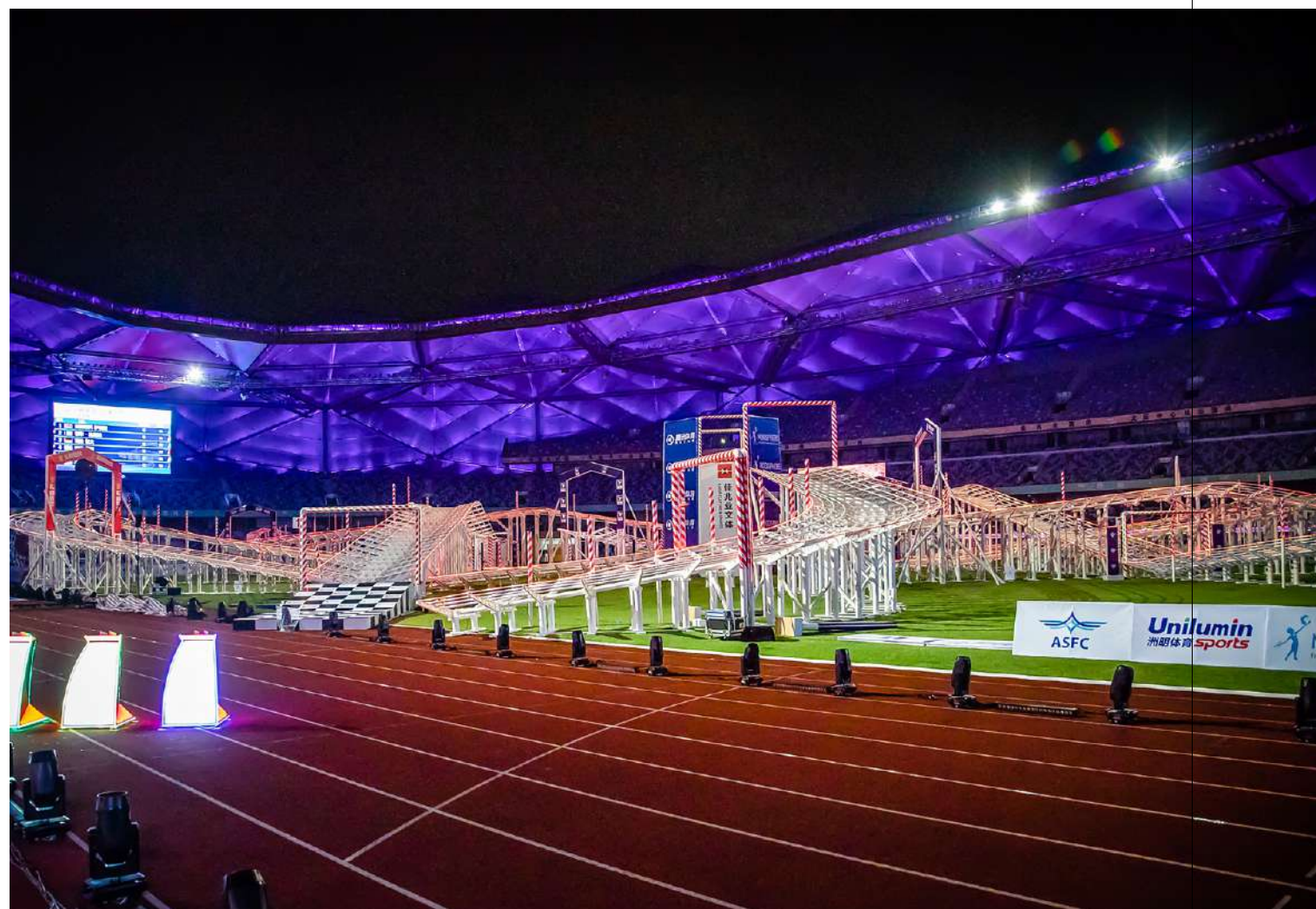
All the pilots had the chance to train online before arriving in China using a track simulator developed by teenage drone expert Elouan Jorrand from France. Being able to train prior to an event in this way is one of the advantages of e-sports such as drone racing, for which online simulators give competitors almost the same experience as they will have on race day. The simulator was also available to the general public, who had a chance to compare their lap times to those of the competitors.





# BEHIND THE SCENES

A huge amount of work goes into organising an international sporting event on the scale of the 2018 FAI World Drone Racing Championships. The Federation would like to thank the Aero Sports Federation of China, the Municipal Government of Shenzhen, Kaisa Culture & Sports, and everyone on the FAI team for all the effort they put in to make this event so successful.

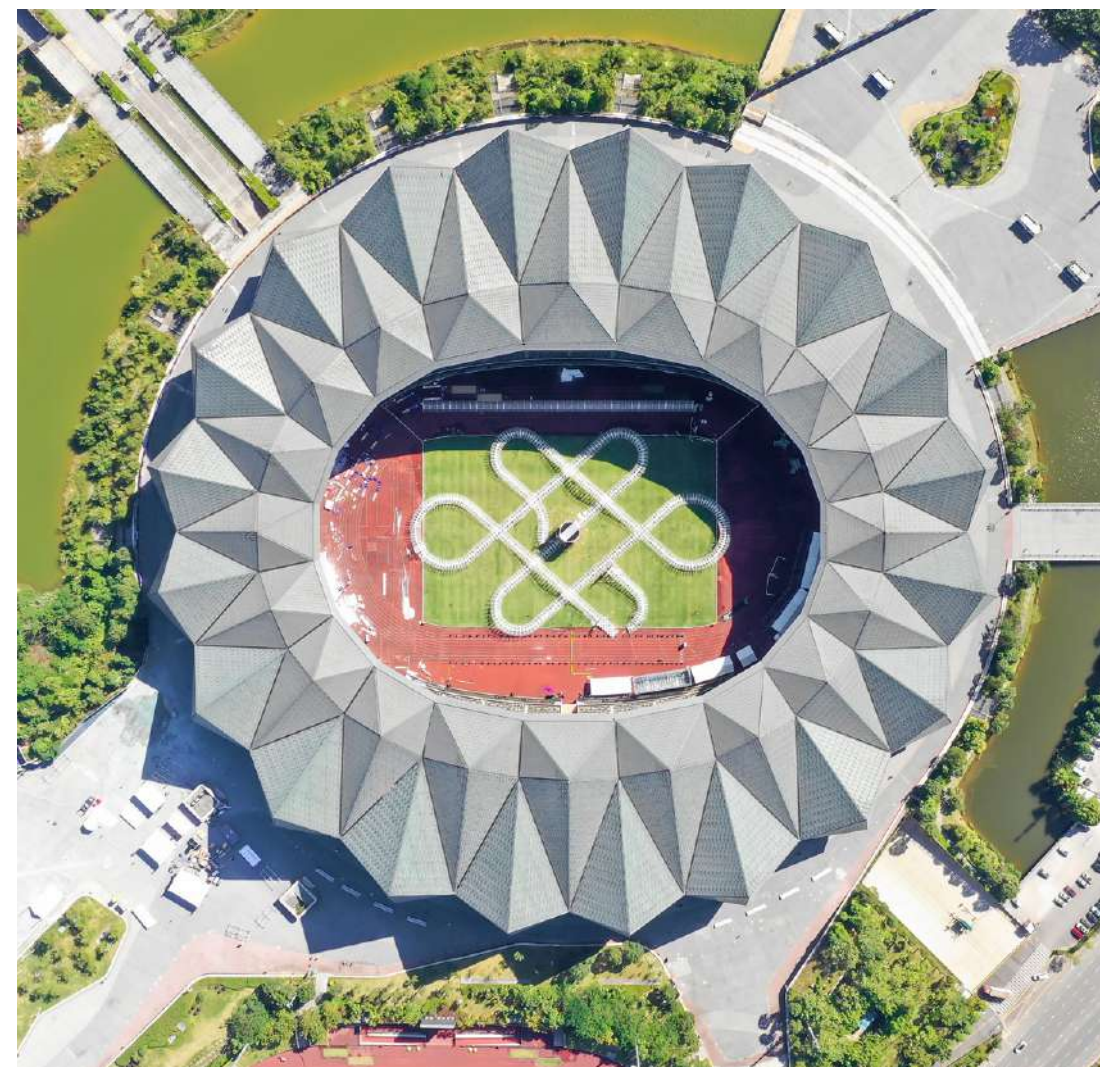


Founded in 1964, the Aero Sports Federation of China (ASFC) is the FAI Member for China and is involved in many of the exciting developments changing the face of air sports in Asia at the moment.

The Association's Zhuoyue Yang said:

***"Despite its long history, air sports are still***

***in their infancy in China. However, they are undergoing a rapid growth stage. Currently, aeromodelling is the most popular air sport in China, while drone sports are the fastest growing activity of this kind."***



## SHENZHEN MUNICIPAL GOVERNMENT

The FAI World Drone Racing Championships could not have taken place without the support and cooperation of the Shenzhen Municipal Government.

Not only did the local government help to organise the event by appointing Kaisa Culture & Sports and supervising the preparations by arranging regular coordination meetings, it acted as the main sponsor for the competition.

Shenzhen Municipal Government also did a fantastic job preparing the city of Shenzhen to host this world-class drone-racing meet.





# 佳兆业文体

## KAISA CULTURE & SPORTS

Kaisa Culture & Sports Group (KCSG) is a subsidiary of Kaisa Group Holdings Ltd. and has become a large cultural and sports venue operator in China.

It is also involved in film production, arts and sports training, as well as cultural and sports activities.

The highly efficient Kaisa team in Shenzhen was indispensable to the smooth running of the competition.



As in any sporting event, capable, experienced judges are essential to ensure a fair result. Because the action on the field happens so quickly, they watch the live video feed from each competitor to make sure the run is clean. Our thanks to them, and to all the technicians, organisers, and volunteers who made this event such a success!





The background of the image is a dark, atmospheric scene featuring a drone racing track. A small, red and white drone is visible in the upper left, flying through a rectangular frame made of red and black striped poles. The track itself is a complex structure of white, angular, and translucent barriers. Several bright, glowing lines in shades of blue and purple crisscross the scene, creating a sense of motion and high-tech environment. The overall lighting is dramatic, with strong highlights on the track's edges and the drone.

# 2018 FAI DRONE RACING WORLD CUP



# MAP OF THE 2018 FAI DRONE RACING WORLD CUP

The 2018 FAI Drone Racing World Cup was the biggest yet, involving a total of 669 pilots from 41 countries, up from 435 pilots from 37 countries in 2017.

2018 Indonesia Drone Racing World Cup  
Bali (Indonesia)

2018 China Drone Racing Open (WDRC Test Match)  
Shenzhen (People's Republic of China)

2018 Drone Festival Race  
Gdynia (Poland)

2018 Seoul Drone Race World Cup  
Seoul (Korea)

2018 Leiria Drone Race World Cup  
Leiria (Portugal)

2018 WDR Paris World Cup  
Brétigny-sur-Orge (France)

2018 German Drone World Cup  
Nördlingen (Germany)

2018 Cabourg World Cup  
Cabourg (France)

2018 International Drone Race Slovakia - Trencin FPV Cup  
Trenčín (Slovakia)

2018 FPV Racing World Cup  
Prilep (Former Yugoslav Rep. of Macedonia)

2018 Jämi FPV Open  
Jämijärvi (Finland)

2018 Barcelona Drone Racing F3U World Cup  
Barcelona (Spain)

2018 World Cup Russia  
Moscow (Russia)

2018 World Cup Latvia Drone Racing  
Riga (Latvia)

2018 World Cup Spain - La Rinconada  
Seville (Spain)

2018 Mitteldeutscher FPV Race Cup  
Bitterfeld (Germany)

2018 EPFL Drone Racing Cup  
Lausanne (Switzerland)

2018 Daegu Drone Race World Cup  
Daegu City (Korea)

2018 F3U World Cup Italy  
Magreta di Sassuolo near Modena (Italy)

2018 Noosphere Race Cup  
Dnipro (Ukraine)

2018 F3U Pam Cup  
Plovdiv (Bulgaria)

2018 Phoenix World Cup  
Prilep (Former Yugoslav Rep. of Macedonia)





# A SERIES OF WORLD-CLASS COMPETITIONS



The FAI Drone Racing World Cup is a unique event offering fun and excitement for competitors and spectators alike. It brings together drone racers from all over the world, and gives them a platform from which to show off their considerable skills, while pitting their drones against other top-flight pilots.

The 2018 competition included 22 events, kicking off with April's Indonesia Drone Racing World Cup in Bali, and closing with October's Phoenix World Cup event in Prilep, Former Yugoslav Republic of Macedonia.

The tracks built for the competition ranged widely. In Barcelona, Spain, pilots enjoyed flying out in the desert-like wilds. In Daegu, Korea, they raced their drones around an impressive, LED-lit track.



Competitors at each event participated in a series of races flying multi-rotor drones with at least three power-driven propellers and weighing no more than 1kg.



# WORLD CUP WINNER – KILLIAN ROUSSEAU

French drone ace Killian Rousseau, 14, was victorious in the 2018 edition of the FAI Drone Racing World Cup. The teenage drone pilot claimed the top spot in this year's competition after seeing off no fewer than 668 other competitors hailing from 41 different countries.

Poland's Jan Wielgosz, also a Junior competitor, took second place, and David Spacek of Czech Republic was third. Rousseau's overall win was supported by amazing performances at a number of World Cup events throughout the year. High points included Paris and Bitterfeld, where he won, and Barcelona, where he finished fourth.





# THE COMPETITION

In 2018, FAI Drone Racing World Cup contests took place in 19 different countries ranging from China to Finland, Brazil to France, and Russia to Korea; reflecting the international popularity of drone sports.

Many of the competitors made it to numerous contests throughout the year, with Junior pilots dominating the podiums at lots of events. Of the first eight pilots overall, six were in the Junior category.



Female pilots also put in a strong performance, with FAI World Women's Drone Racing Champion Wanraya Wannapong winning the World Cup event in Shenzhen, China.





## RULES

1. Only specific open international contests are eligible for the World Cup.
2. A maximum of two contests can be held per country per year (unless the country covers more than three time zones, in which case the maximum is four).
3. Only contests in which competitors from at least two countries have completed flights can count towards the World Cup rankings.
4. The number of World Cup points awarded depends on the number of pilots taking part in a contest.

5. The highest number of points a competitor can receive for winning a contest is 48.
6. A pilot's total World Cup score is the sum of the points won from his or her best four competition results in different countries.

7. The winner is the pilot with the highest total score.
8. In the event of a tie, pilots' fifth and sixth best results can be taken into account to determine the final placings.







# DEEPER INTO DRONES



# WHAT IS DRONE RACING?

In drone racing, a relatively recently FAI-sanctioned sport that has seen phenomenal growth, up to six pilots at a time race battery-powered drones around a specially constructed track. Races last two or three minutes, and the fastest pilot wins.



## DRONE

Tracks can be as simple as two sticks 50m apart in a field, or as complex as an F1 racetrack, and the drones used are small and fast. Typically they weigh less than 250g, can accelerate to more than 100km/h in a couple of seconds, and are piloted via remote control.



## RACE

Most races involve pilots launching from the ground and navigating a race track, dodging slalom poles and ducking under gates. The aim is to get round in the fastest time, without crashing out – either by hitting a gate or another drone.

## HELPERS

Pilots fly with a helper - usually also a drone pilot - beside them to watch the race as a whole and give the pilot details he can't see through his FPV goggles, such as where the other drones are. At present, racing is the most popular form of drone sport. However, new ways to fly drones competitively, including team-based sports, are also emerging.

## GOGGLES

There is an onboard camera, which feeds back to the pilot's first-person view (FPV) goggles, giving the pilot – or drone operator – a real-time view, as if they are sitting in the drone.





In Barcelona, FAI partner Freespace Drone Racing wowed the fans with demonstration races showing just how visually exciting larger drones are for spectators.

DEEPER INTO DRONES



# 2018 FAI INTERNATIONAL DRONES CONFERENCE & EXPO

The FAI International Drones Conference and Expo offers a unique platform for sports organisations, businesses, governmental authorities, and end users to discuss how drones are used today, and create a framework for how they will be used in the future.



DEEPER INTO DRONES





# CONFERENCE

Part of the public EPFL (Ecole Polytechnique Fédérale de Lausanne) Drone Days 2018, the 2nd FAI International Drones Conference and Expo ran from 31 August to 2 September, and welcomed expert speakers and visitors from around the world.

Held at the EPFL Rolex Learning Center in Lausanne, Switzerland, the aim of the event is to create greater understanding about how drones are, and could be, used as well as how they affect the use of air space and our view on the world. This year, it was also the venue for the presentation of the Prince Alvaro de Orleans-Borbon Grant, claimed by drone ambulance innovator Vincenzo Navaneri.

# EXPO

The Expo at the conference was open to all, and was a chance for the public to find out more about drones in industry and recreation. Hands-on demonstrations allowed children and adults to take their first flight, and learn more about how drones are being used around the world.

# COMPETITION

The 2018 EPFL Drone Racing Cup showed off drone racing at its finest during the EPFL Drone Days 2018. Switzerland's Moritz Werffeli won, coming out top on the final race after three days of competition. Fifty-eight pilots from seven countries took part. Werffeli, 25, from Zurich, Switzerland said it was the first FAI race he had flown in. ***“Cool race, good people, fast track.”***



# FAI

With its history of promoting innovation, and its decades of competitive air sport and regulatory experience, the FAI is perfectly placed to lead the way in the development of drone sports.

We believe that organising this international conference to enable stakeholders from across the drone universe to collaborate and learn from one another is an important part of that role.

