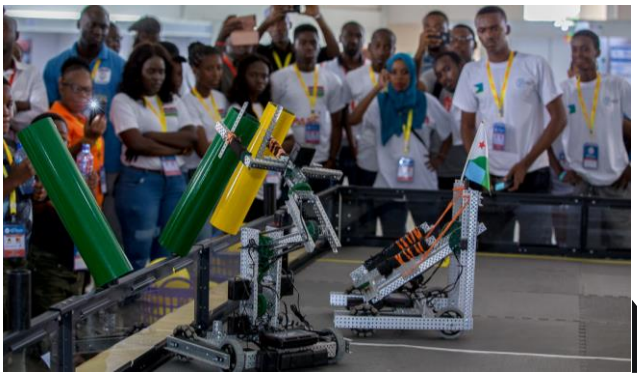
PARC
Pan-African Robotics Competition

PARC 2019
Accra, Ghana
ONE PAGE RECAP



The Making of African Smart Cities

42 competing teams were challenged to use science and technology to devise solutions for the planning, design, management and transformation of future African cities.

18 PARTICIPATING COUNTRIES

Benin, Burundi, Djibouti, DR Congo, Ethiopia, Gabon, Gambia, Ghana, Ivory Coast, Liberia, Lesotho, Mali, Nigeria, Senegal, South Africa, United States of America, Zimbabwe

EVENT ACTIVITIES

July 3 – Community STEM Day
July 4 – MAKERS & ENGINEERS Competition
July 5 – TECHS & STARS Competition
July 6 – Championship Games & Awards Ceremony

THE RESULTS ARE IN...

TECHS – Making Livable Cities
1st place: Zimbabwe Tynwald High School

STARS – Making Resilient Cities
1ST place: Making Our Visions & Aspirations Reality / Gambia Robotics Hub

MAKERS- Making Healthy Cities
1st place: Ghana SOS Lafiya

ENGINEERS – Making Mobile Cities
1ST place: Senegal Dakar American University of Science & Technology

PARC 2019 SPONSORS

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PARC 2019

The Making of African Smart Cities

PARC is the Pan-African Robotics Competition, an initiative created to inspire the youth while promoting STEM education within the African community. PARC challenges are based on real-world topics relevant to science, technology, and the sustainable development of Africa. Competing teams are judged on poster and oral presentations, as well as Robotics. Participating students can compete in one of four leagues:

Techs (middle school)	Grades: 4 – 8	Age: 11 – 15 years	VEX IQ Super Kit
Stars (high school)	Grades: 9 – 12	Age: 15 – 19 years	VEX V5 Super Kit
Makers (high school)	Grades: 9 – 12	Age: 15 – 19 years	Open Challenge
Engineers (university undergraduates)		Age: NA	Open Challenge

PARC 2019 took place from July 3 – 6 on the beautiful campus of Central University, Miotso Campus in Ghana. 42 teams were confirmed to attend, but due to financial limitations, only 34 teams made it to the competition. These teams competed in this year's challenge to create livable, resilient, healthy and mobile, African Smart Cities. For each league, first, Second and Third place winners were recognized. Four additional teams recevied Excellence Awards for great design, spirit and teamwork.



TECHS LEAGUE

MAKING LIVABLE CITIES

Urbanization is a powerful driver for economic development and social mobility; it has also been a catalyst of technological development in cities globally. As home to some of the fastest growing cities in the world, Africa is no exception. However due to improper planning, the urbanization of African cities has led to the growth of slums, urban poverty, and unsanitary environments.

PARC2019 challenged eight Tech teams to solve urban planning related challenges by building robots to execute the city's land-use plan, aid in job training centers, and manage city waste.

LEVEL 1: URBAN DEVELOPMENT

Objective 1: Move the infrastructures (hospital) from the construction site to the appropriate installation zones in the city.

Objective 2: Pickup and plant crops on the designated space on the vertical farm at the job training center.

LEVEL 2: WASTE MANAGEMENT

Objective 3: Sort the garbage, waste vs plastic recyclables.

Objective 4: Transport trash to the Waste Management Facility.

Objective 5: Transport plastic to the Recycling Center.



TECHS LEAGUE 2019 WINNERS

First place winner:

ZIMBABWE: Tynwald High School

Second place winner:

SENEGAL: Senegalese American Bilingual School

Third place winner:

MALI: RobotsMali

STARS LEAGUE

MAKING RESILIENT CITIES

Resilience is about surviving and thriving, regardless of the challenge. 100 Resilient Cities—Pioneered by The Rockefeller Foundation (100RC) is dedicated to helping cities around the world become more resilient to the physical, social and economic challenges that are a growing part of the 21st century.

One such challenge is flooding. African cities are often scenes of large scale flooding which have devastating impact on City mobility, health, and economy. STARS teams are tasked to build robots to prevent and manage flooding in African Cities.

Objective 1: Transport and assemble PVC pipeline for redirecting rainwater to city canals and floodways

Objective 2: Draining floodwater from the city to pump stations

STARS LEAGUE 2019 WINNERS

First place winner:

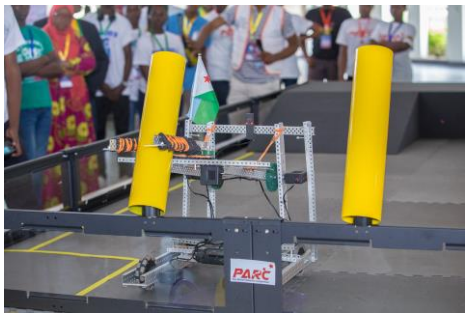
GAMBIA: Making Our Visions And Aspirations Reality (MOVAAR) / Gambia Robotics Hub

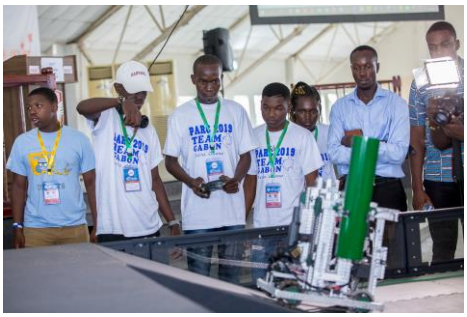
Second place winner:

DJIBOUTI: Centre de Leadership et de l'Entrepreneuriat

Third place winner:

SENEGAL: Senegalese American Bilingual School







MAKERS LEAGUE

MAKING HEALTHY CITIES

Urban health in African cities is increasingly challenging. Cities often put human health at risk from pollution and other health hazards; lack of access to health care services; and problems related to cities' sedentary lifestyle such as obesity and more. Future African cities must be designed for people at the forefront - offering places where we can live well and be healthy.

MAKERS are challenged to use their technical skills and imagination to conceptualize and build a tabletop scale model of a "Healthy City" to elevate the well-being of city dwellers through improved living conditions and better health services. Teams learn to deliver clear, concise and effective oral and visual presentations.

Teams are encouraged to consider major factors which significantly influence our health such as air pollution, water supply, sanitation, nutrition, food safety, health services, housing conditions, working conditions, education, and lifestyles; then design a city which solve one or more of these challenges. Competition Deliverables:

- Design and build tabletop scale model
- Create a poster
- Deliver a presentation
- Assemble portfolio using Design Thinking

MAKERS LEAGUE 2019 WINNERS

First place winner:

GHANA: SOS Lafiya – air pollution, waste management, drainage, housing and nutrition solutions

Second place winner:

MALI: École Supérieure D'ingénierie, D'architecture et D'urbanisme (ESIAU-Mali) – chemical free vegetable park, automated waste dispenser, water storage tank

Third place winner:

NIGERIA: BredHub Team – Air quality monitoring for indoor and outdoor use

ENGINEERS LEAGUE

MAKING MOBILE CITIES

As cities grow and urban population rises, the need for transport of good and people has become extremely complicated. In African cities, traffic congestions, road accidents, overcrowded buses, and lack of sidewalks significantly hinder the mobility of goods and people.

PARC 2019 challenges ENGINEERS to use their engineering skills to design and build a 4IR enabled system, device, machine, or software to improve the mobility of good and people in an urban environment. The Fourth Industrial Revolution (4IR) is characterized by a fusion of technologies that is blurring the lines between the physical, digital / AI, and biological spheres, collectively referred to as cyber-physical systems.

Think transit system and scheduling, public transportation, on-demand shuttles, driverless vehicle, shared cars/bikes, flying cars, tunnel transport (e.g., Hyperloop), smart traffic intersection lights, parking, electrical vehicle and bikes, pedestrian sidewalks, bike lanes, etc. ENGINEERS teams must design and prototype an 4IR enabled technology which provide efficient mobility of people and good in African cities. Competition Deliverables:

- Fully working prototype of solution
- 10 minute power-point presentation and on-stage demonstration of prototype
- Quad Chart Poster
- Project Report minimum 15 pages

ENGINEERS LEAGUE 2019 WINNERS

First place winner:

SENEGAL: Dakar American University of Science and Technology – water floating car parking lot and shuttle system

Second place winner:

MALI: École Supérieure D'ingénierie, D'architecture et D'urbanisme (ESIAU-Mali) – modular adaptable transporation system used for ground and water use.

Third place winner:

DJIBOUTI: Centre de Leadership et de l'Entrepreneuriat – truck driver incident prevention mobile phone signal scrambler

PARC COMMUNITY STEM DAY

PARC 2019 was the first year that we introduced a Community STEM Day. It was held on July 3 from 13:00 – 17:00. Members of the community were invited to PARC for a day to learn about Science, Technology, Engineering and Mathematics (STEM). Students and parents alike were welcome to walk around the exhibition hall to see the student projects and visiting exhibitors. STEM organizations offered free hands-on science and engineering activities for everyone in attendance.




PARC 2019 COMMUNITY STEM DAY EXHIBITORS

MAKERS & ENGINEERS LEAGUE EXHIBITS

Student solutions in making healthy and mobile cities

TECH & STAR LEAGUES OPEN PRACTICE FIELD

Student robots that create livable and resilient cities

MATHWORKS

Free introductory training on how to code

UBTECH

Lessons on how to assemble and control miniature robots

YCREATORS

Demonstrations on smart lego robotics garbage collector & fire fighting truck

DISCBOTS OF DEKALB INTERNATIONAL ROBOTICS ALLIANCE

Engaging activity on how to build your own hand rockets

PARC IN THE MEDIA


The STARS League Champions, Team Gambia, received a warm welcome home from news agencies, family and friends who met them at the airport to congraulate them on their achievement.

Senegalese American Bilingual School and Dakar American University of Science and Technology being interviewed by local Senegalese news for their success in the PARC competition.

Capitalk 100.4FM radio station in Zimbabwe interview the Tynwald High School Team when they returned home with the title of first place TECH League champions.

DW news follows PARC participant, Genevieve, a teenager in Bunso, Ghana who wants to become a mechanical engineers. Genevieve is a part of the STEMBees organization and is determined to improve the life of her family and her community through STEM.




Winning teams pose with their country flags.

Teams pictured from left to right: Senegal, Nigeria, Djibouti and Mali