Workshop on
Culturally Sensitive Social Robotics for All

Abu Dhabi 2023
iCAR

21st International Conference on Advanced Robotics
Abu Dhabi, UAE
5th December 2023

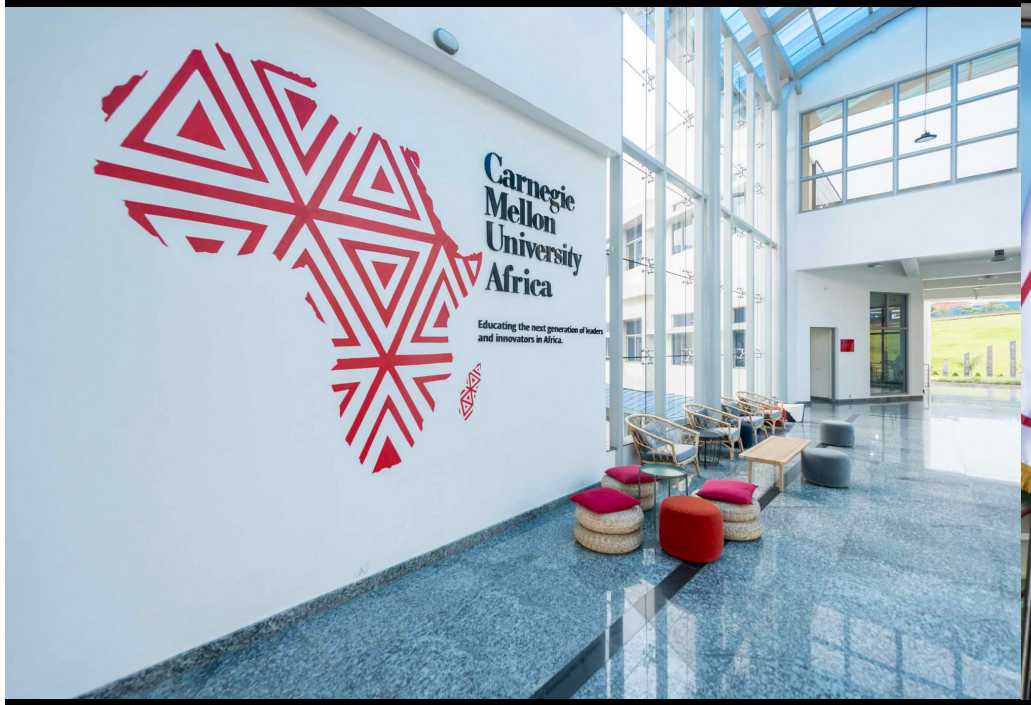
The Importance of Cultural Competence for Diversity, Equity, and Inclusion

David Vernon

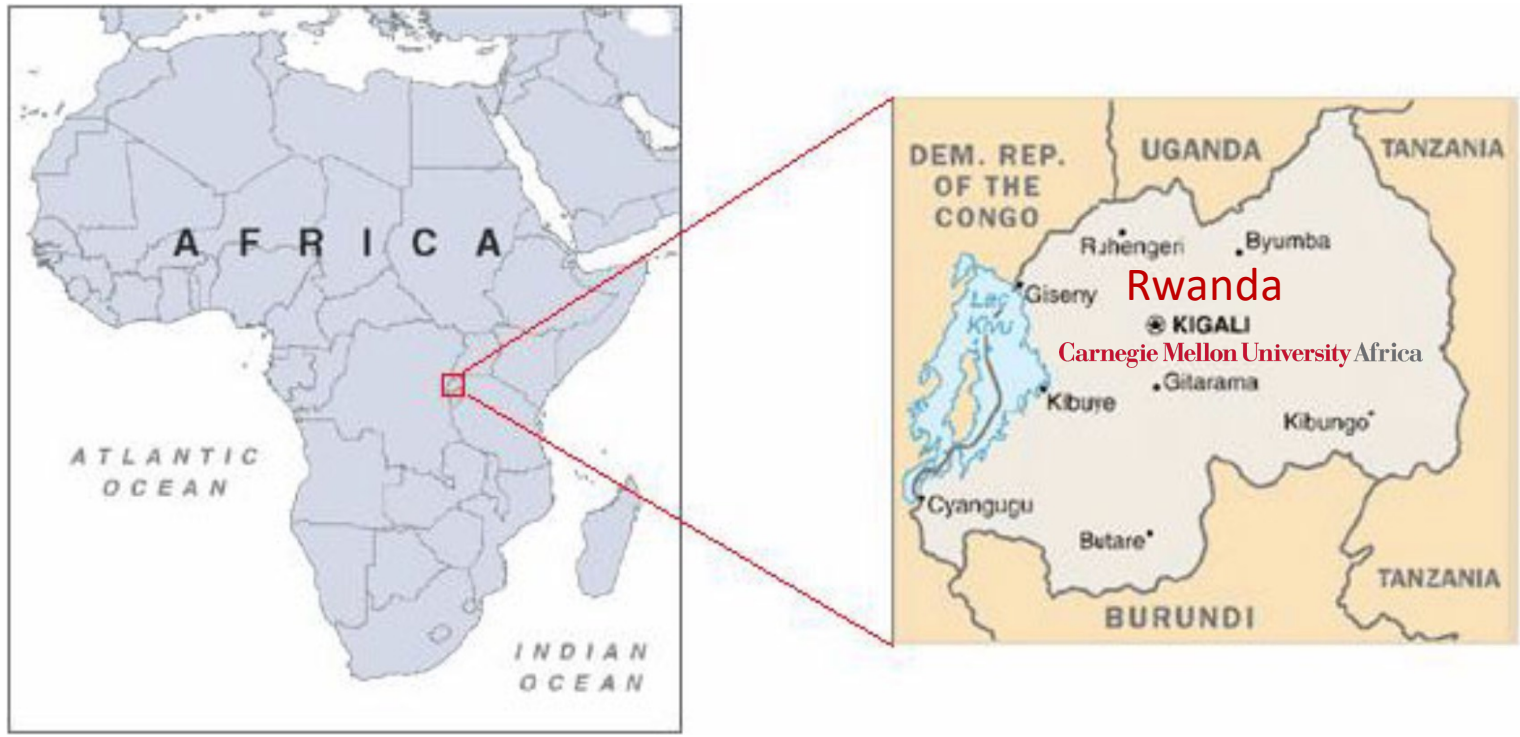
Carnegie Mellon University Africa

www.vernon.eu

IEEE Robotics & Automation Society IEEE جامعة خليفة Khalifa University



www.africa.engineering.cmu.edu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TANZANIA
Ruhengeri
Byumba
Rwanda
Gisenyi
Lac Kivu
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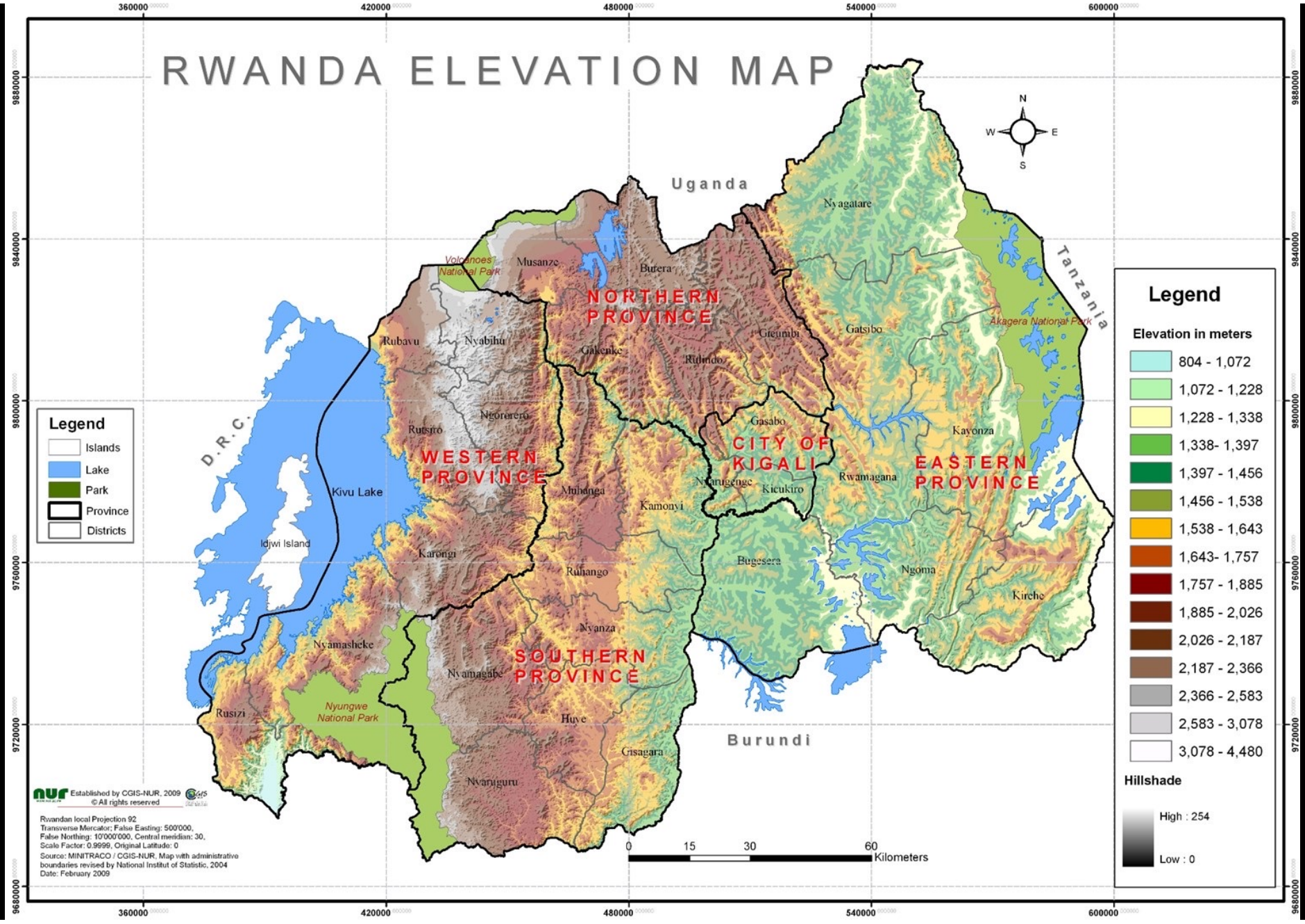
Carnegie Mellon University Africa
Gitarama
Kibuye
Kibungo
Cyangugu
Butare
TANZANIA
BURUNDI


RWANDA ELEVATION MAP
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Nyungwe National Park
Kivu Lake
Idjwi Island
Musanze
Burera
Nyagatare
Rubavu
Nyabihu
Gakenke
Rulindo
Gicumbi
Gatsibo
Ngororero
Rutsiro
Gasabo
Kayonza
Nyarugenge
Kicukiro
Rwamagana
Muhanga
Kamonyi
Karongi
Ruhango
Bugesera
Ngoma
Kirehe
Nyanza
Nyamasheke
Nyamagabe
Huye
Gisagara
Rusizi
Nyaruguru
NORTHERN PROVINCE
WESTERN PROVINCE
CITY OF KIGALI
EASTERN PROVINCE
SOUTHERN PROVINCE
Legend
Islands
Lake
Park
Province
Districts
Legend
Elevation in meters
804 - 1,072
1,072 - 1,228
1,228 - 1,338
1,338- 1,397
1,397 - 1,456
1,456 - 1,538
1,538 - 1,643
1,643- 1,757
1,757 - 1,885
1,885 - 2,026
2,026 - 2,187
2,187 - 2,366
2,366 - 2,583
2,583 - 3,078
3,078 - 4,480
Hillshade
High : 254
Low : 0
0
15
30
60
Kilometers
Established by CGIS-NUR, 2009
© All rights reserved
Rwandan local Projection 92
Transverse Mercator; False Easting: 500'000,
False Northing: 10'000'000, Central meridian: 30,
Scale Factor: 0.9999, Original Latitude: 0
Source: MINITRACO / CGIS-NUR, Map with administrative boundaries revised by National Institut of Statistic, 2004
Date: February 2009

Photo credit: Tallis Woomert

Photo credit: Tallis Woomert

Photo credit: Tallis Woomert

Artificial intelligence (AI), facilitated by easier data collection and improved computing resources, is shaping the dynamics of many sectors that are closely linked with achieving the Sustainable Development Goals. Many African countries have tremendous opportunities to use AI in a number of key sectors including finance, agriculture, health, infrastructure and food security. However, the lack of expertise and capacity, as well as impacts of the current Covid19 pandemic, pose significant challenges. Despite the extensive promises of AI to transform economies and expedite development, the challenges and adverse impacts need to be studied thoroughly.

https://sites.google.com/view/aia2020/home

REPORT

The Fourth Industrial Revolution and digitization will transform Africa into a global powerhouse

Njuguna Ndung'u and **Landry Signé** · Wednesday, January 8, 2020

https://www.brookings.edu/research/the-fourth-industrial-revolution-and-digitization-will-transform-africa-into-a-global-powerhouse/

Centre for the Fourth Industrial Revolution

C4IR Rwanda

The Centre for the Fourth Industrial Revolution Rwanda (C4IR Rwanda) brings together government, industry, civil society, and academia to co-design, test and refine policy frameworks and governance protocols that maximize the benefits and minimize the risks of 4IR technologies. The Centre is primarily focusing on artificial intelligence and data policy, and seeks to develop multi-stakeholder partnerships to drive innovation and adoption at scale for the benefit of society.

https://www.weforum.org/centre-for-the-fourth-industrial-revolution/c4ir-rwanda

C4IR South Africa

The Centre for the Fourth Industrial Revolution South Africa (C4IR South Africa) supports industry transformation across various sectors, supports government transformation to maintain robust and resilient technology governance protocols and develops and deploys frameworks to support awareness and development of frontier technologies.

https://www.weforum.org/centre-for-the-fourth-industrial-revolution/c4ir-south-africa

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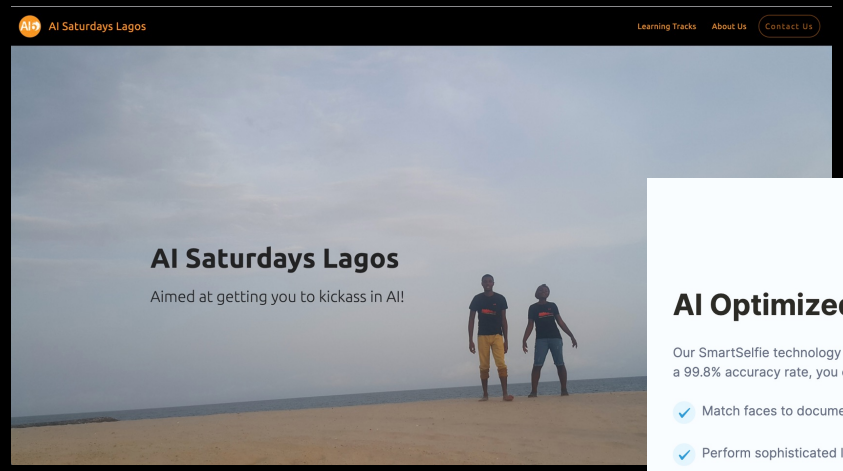
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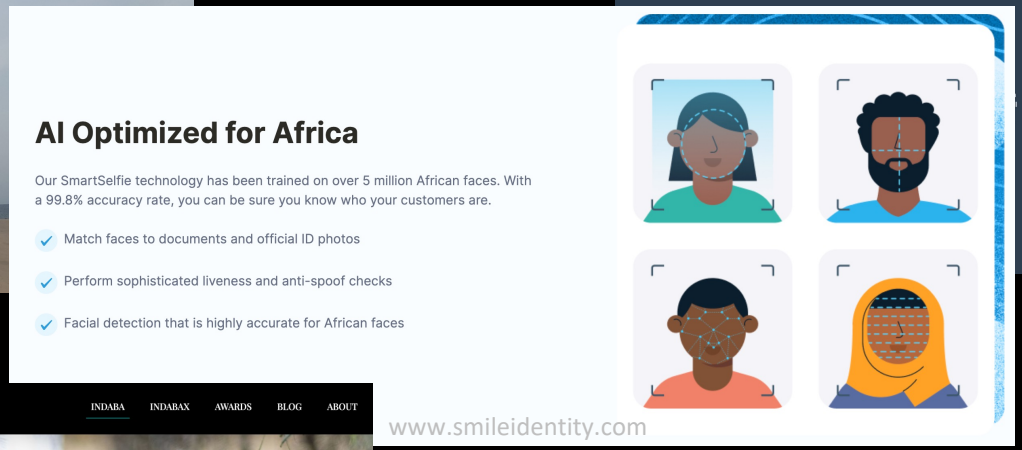
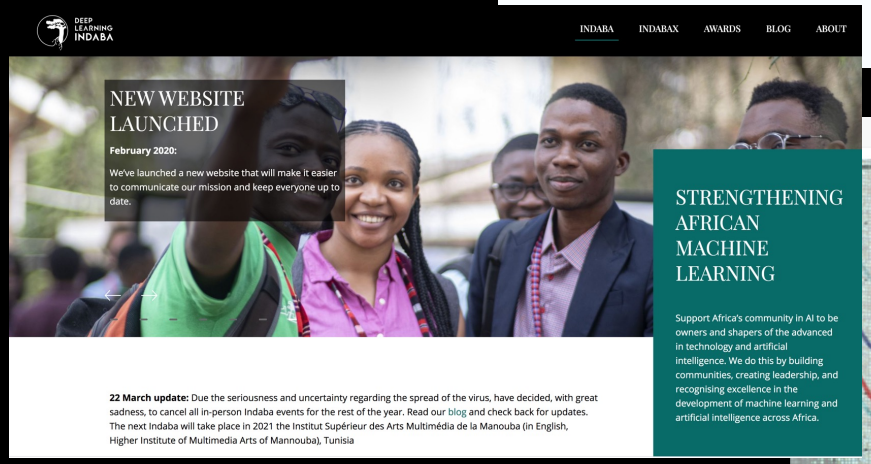
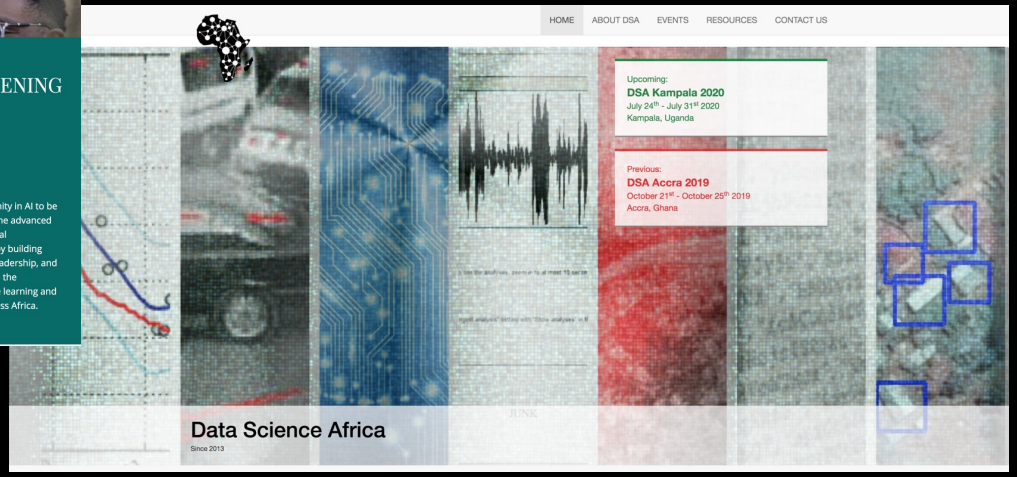
Aimed at getting you to kickass in AI!

Intro
The School
Who Should Apply
Faculty
Applications
Sponsors & Affiliates
Essential Info & FAQ
Contact
IBRO-SIMONS COMPUTATIONAL NEUROSCIENCE IMBIZO
#isiCNI2022
The next Imbizo will be held in 2022
Imbizo is a Xhosa word meaning "a gathering to share knowledge". The IBRO-SIMONS Computational Neuroscience Imbizo, or ISi-CNI is exactly that: an opportunity for African and international students to learn about cutting edge research techniques in computational neuroscience.


AI Optimized for Africa
Our SmartSelfie technology has been trained on over 5 million African faces. With a 99.8% accuracy rate, you can be sure you know who your customers are.
Match faces to documents and official ID photos
Perform sophisticated liveness and anti-spoof checks
Facial detection that is highly accurate for African faces
www.smileidentity.com


DEEP LEARNING INDABA
INDABA
INDABAX
AWARDS
BLOG
ABOUT
NEW WEBSITE LAUNCHED
February 2020:
We've launched a new website that will make it easier to communicate our mission and keep everyone up to date.
STRENGTHENING AFRICAN MACHINE LEARNING
Support Africa's community in AI to be owners and shapers of the advanced in technology and artificial intelligence. We do this by building communities, creating leadership, and recognising excellence in the development of machine learning and artificial intelligence across Africa.
22 March update: Due the seriousness and uncertainty regarding the spread of the virus, have decided, with great sadness, to cancel all in-person Indaba events for the rest of the year. Read our blog and check back for updates. The next Indaba will take place in 2021 the Institut Supérieur des Arts Multimédia de la Manouba (in English, Higher Institute of Multimedia Arts of Mannouba), Tunisia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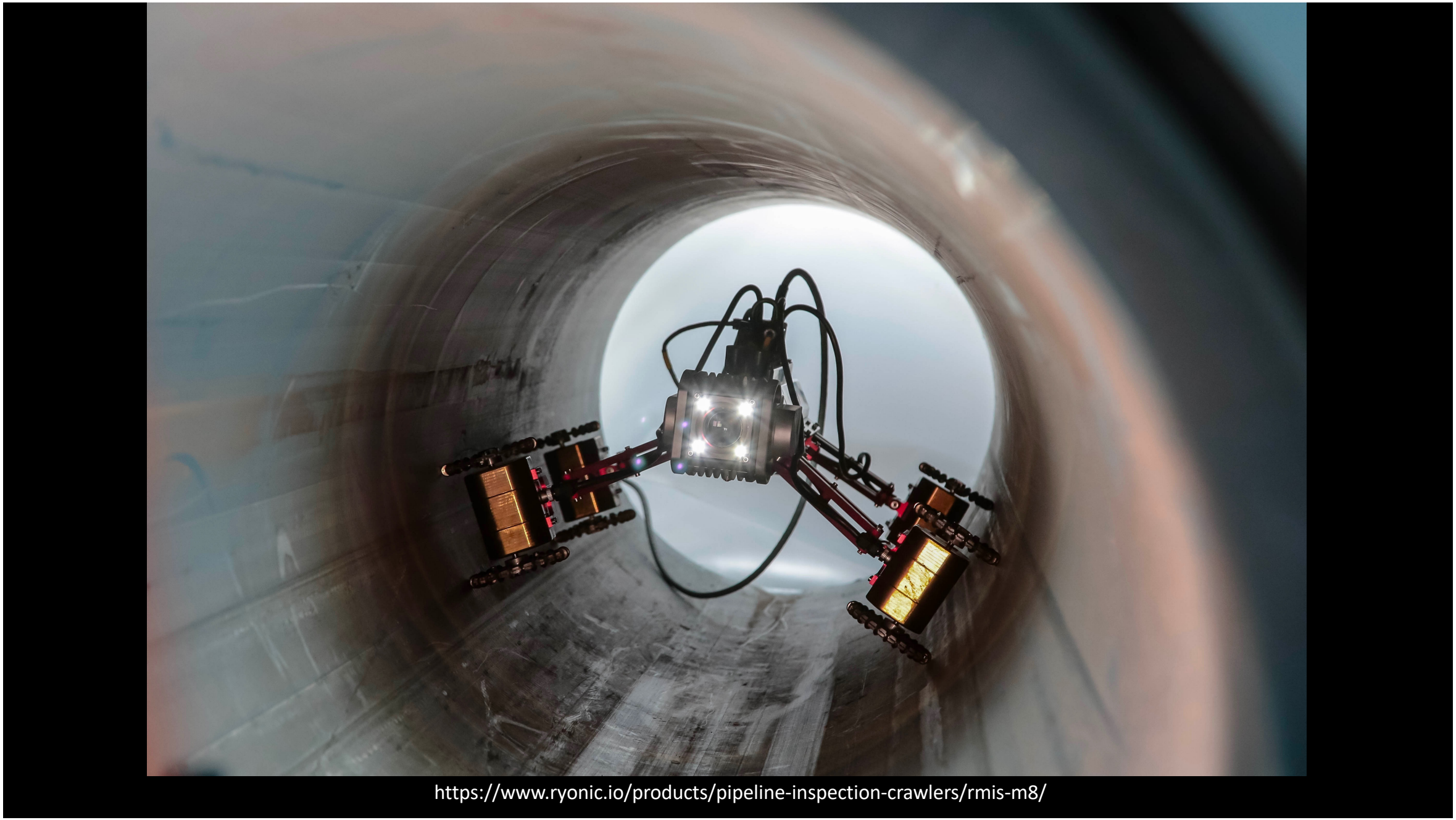
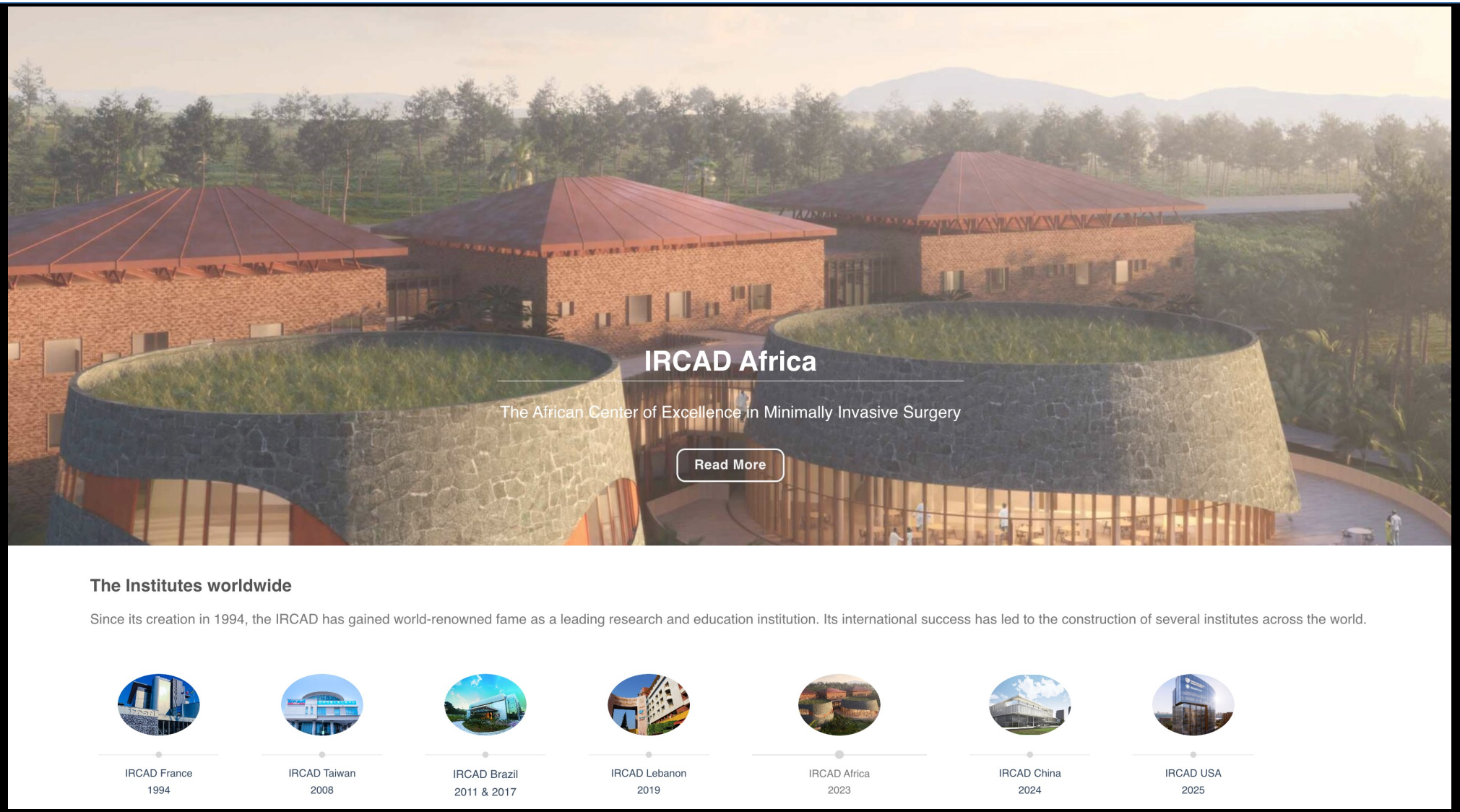
Upcoming:
DSA Kampala 2020
July 24th - July 31st 2020
Kampala, Uganda
Previous:
DSA Accra 2019
October 21st - October 25th 2019
Accra, Ghana
Data Science Africa
Since 2013



https://www.ryonic.io/products/pipeline-inspection-crawlers/rmis-m8/



https://ircad.space/

IRCAD has opened a training and R&D centre in Rwanda for minimally-invasive surgery using the latest in computer vision and robotics technology

ircad France

Live now

MIS training center | E-learning | The Institute | Research & Development | Communications

Upper GI Robotic Surgery Advanced Course 2022

Register Now

Course objectives

- To identify the specific robotic platform components, settings, and features required to safely use and operate the robotic surgical platform
- To understand the proper robotic platform in the preoperative set-up for upper GI surgery
- To understand and replicate the critical surgical steps for the safe and effective use of the robotic platform in upper GI surgery
- To define the role of the robot in the current esophageal and gastric surgery practice
- To appreciate the strengths and weaknesses of this emerging field

Educational methods

- Lectures with interactive discussions between participants and Faculty members
- Interactive sessions with operating surgeons during live surgery
- Video-based discussion sessions with Q&A
- Robotic surgery training and practice on simulators and anatomical specimens including the latest generation of da Vinci® robotic systems

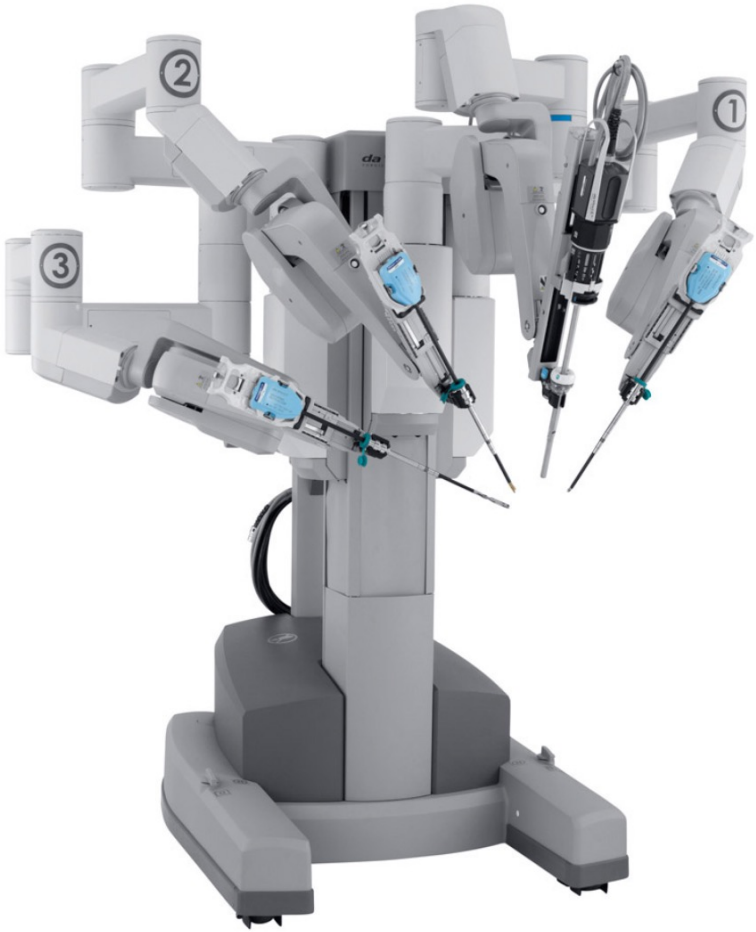
Cancellation policy

View cancellation policy >

Target audience

This course is intended for general surgeons, digestive surgeons, fellows and residents in training

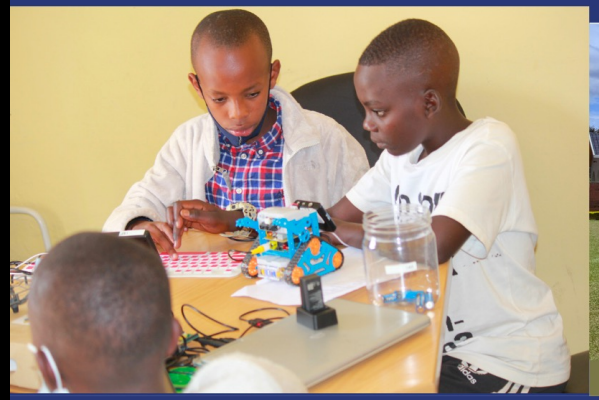
https://www.ircad.fr/course/upper-gi-robotic-surgery-advanced-course-2022/



https://robots.ieee.org/robots/davinci/

IRCAD has opened a training and R&D centre in Rwanda for minimally-invasive surgery using the latest in computer vision and robotics technology

Keza Education Future Lab



Keza Education Future Lab (KEFL) is a social driven company that supports the achievement of MINEDUC and its affiliated institution REB in providing quality education by improving the use of science and technology among children. KEFL aims to build on successful foundations in the use of ICT for kids by introducing them to robotics and programming at an early age.

Get in touch

Tel: +250786701376
Email: Keza.info@gmail.com
Website: keza-education.rw
Office Adress: Bibare-Ingeri-St No 192
Kimironko, Gasabo,
Kigali City

Kids are engineers

https://keza-education.rw/

The Future of Work
Kigali, Rwanda

Africa is the youngest and fastest-growing continent in the world. By 2030, there will be 375 million young people in the job market in Africa. Within a few decades, this demographic boom will push Africa's workforce to more than a billion people, the largest in the world. There is a significant gap between the number of young people seeking work and the employment opportunities available to them. Young people will face challenges finding formal employment and a pathway out of poverty. The theme of this year's PARC is ***The Future of Work***. Students are challenged to create solutions for job creation and workforce innovation in Africa.

Download PARC Letter of Notice (English & French)

www.parcrobotics.org/

PARC
Pan-African Robotics Competition

PARC COMPETING TEAMS

TECHS LEAGUE: ARTIFICIAL INTELLIGENCE

Angola: Complexo Escolar Privado Internacional
Benin: femCoders
Botswana: EduStore Africa
Chad: Chadian Canadian International School
Cote d'Ivoire: International Bilingual School of Africa
Djibouti: Centre de Leadership et de l'Entrepreneuriat
DR Congo: SpringX
Gabon: Team Gabon
Gambia: Robotics Hub, The Gambia
Ghana: University Basic School, LegonOur
Guinea: STEM Club Guinea
Kenya: Edustore Africa (Toni Focus)
Lesotho: Lesotho Science and Mathematics Teachers Association
Liberia: SOAR-METS Afrika4D
Mali: RobotsMali
Mauritania: InnovRim
Nigeria: Graceland International School
Rwanda: Green Hills Academy
Senegal: Cours Sainte Marie de HANN
Somalia: Duggaal Media Pro
South Africa: Sci-Bono
Tanzania: Karume Institute of Science and Technology
USA: The BlkRobot Project
Zimbabwe: Tynwald High School

STARS LEAGUE: AVATAR TECHNOLOGY

Angola: Complexo Escolar Privado Internacional
Benin: femCoders
Botswana: The Clicking Generation
Burundi: Great Lakes Initiatives for Communities Empowerment-Glice Burundi
Cameroon: Africagadget
Chad: WenakLab
Congo: UCAC-ICAM
Cote d'Ivoire: AUTO-HUBUTECH
Djibouti: Centre de Leadership et de l'Entrepreneuriat (CLE)
DR Congo: SpringX
Gabon: Team Gabon
Gambia: Robotics Hub, The Gambia
Ghana: SOS - Hermann Gmeiner International College
Guinea: STEM Club Guinea
Kenya: MPESA Foundation Academy
Lesotho: Girls Coding Academy
Liberia: SOAR-METS Afrika4D
Madagascar: ROBOTIAKO
Mali: RobotsMali
Mauritania: Hadina Rimtic
Niger: Google Developer Group Niamey
Nigeria: BredHub (Bliss Robot Education Hub)
Rwanda: Rwanda Coding Academy
Senegal: Senegalease American Bilingual School
Sierra Leone: National Commission for Children
South Africa: SB Decryptors
South Sudan: Team South Sudan Robotic
Tanzania: Apps and Girls
Tunisia: First Skills Club
Uganda: Oysters & Pearls
USA: Neo Engineering League of America
Zimbabwe: Tynwald High School

MAKERS LEAGUE: AFRICAN YOUTH WORKS

Angola: Complexo Escolar Privado Internacional
Benin: femCoders
Botswana: EduStore Africa
Cameroon: Africagadget
Chad: WenakLab
Cote d'Ivoire: AUTO-HUBUTECH
Djibouti: Centre de Leadership et de l'Entrepreneuriat (CLE)
DR Congo: SMARAF EDUK
Egypt: Ismailia STEM high school
Gambia: Robotics Hub, The Gambia
Ghana: PRESEC Robotics And Programming club
Kenya: St. Paul's Gekano boys high school
Lesotho: Soofia International School
Liberia: SOAR-METS Afrika4D
Madagascar: ROBOTIAKO
Malawi: Malawi Robotics Foundation
Mali: DoniFab
Nigeria: The Hillside School Abuja
Rwanda: Agahozo Shalom Youth Village
Senegal: Lycee Billes
South Africa: Sci-Bono Discovery Centre
South Sudan: Team South Sudan Robotic
Sudan: NECFSudan chapter
Tanzania: NLab Innovation Academy
Uganda: Mt. St. Mary's College Namagunga
Zimbabwe: Tynwald High School

www.parcrobotics.org/

All-girls robotics team from Ghana wins World Robofest Championship in the U.S.

ISMAIL AKWEI | Contributor

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May 20, 2019 at 05:00 pm | **TECH & INNOVATION**

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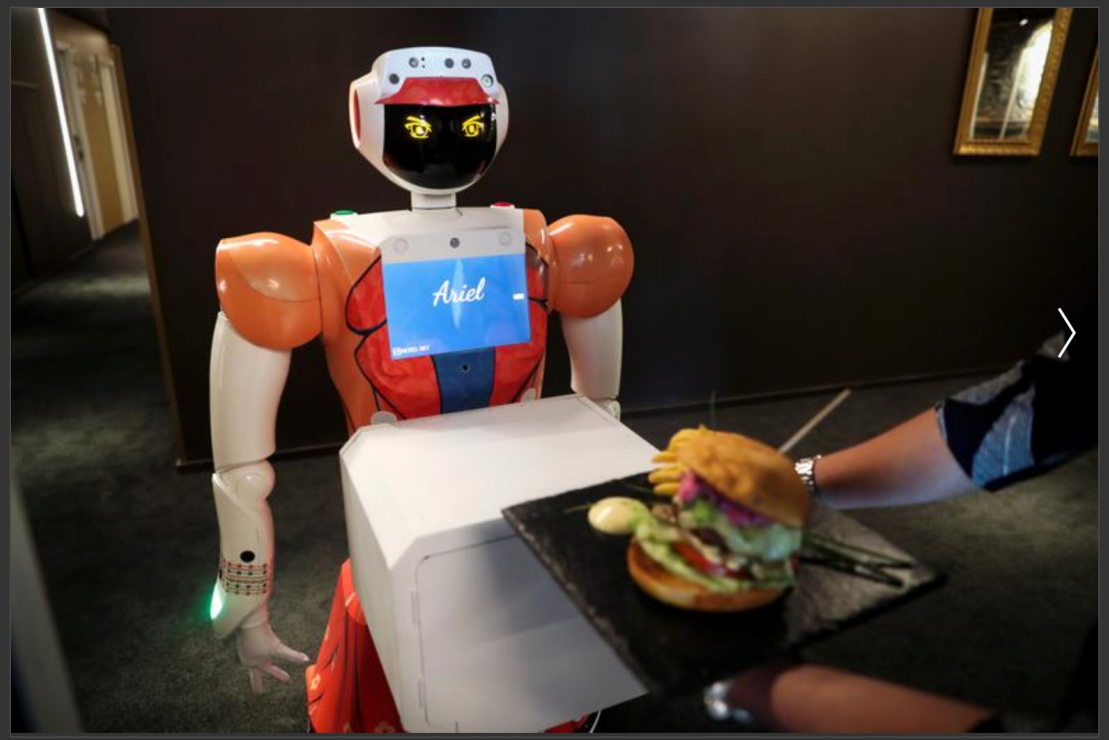
All-girls robotics team from Ghana (Team Acrobot) - Photo: Ghana Robotics Academy Foundation

https://face2faceafrica.com/article/all-girls-robotics-team-from-ghana-wins-world-robofest-championship-in-the-u-s?fbclid=IwAR1OvJIvUIRLGdI3X375nbnX1OAUnSQ2g9S9MA5_A92VhTgfq8LO6zkI3V4

An Ubtech CRUZR service robot deployed by ZoraBots Africa Ltd. to check the temperature of travelers arriving at Kigali International Airport, Rwanda.

Robots at reception: South African hotel turns to machines to beat pandemic



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AI-powered robot Ariel delivers room service to a guest at the Hotel Sky, the first in Africa to use automated attendants, in Johannesburg, South Africa, February 9, 2021. Picture taken February 9, 2021. REUTERS/Sumaya Hisham

https://www.reuters.com/news/picture/robots-at-reception-south-african-hotel-idUSKBN2AF0QX

Robotics and Artificial Intelligence in Africa

By David Vernon

Artificial intelligence (AI) provides many opportunities for social and economic empowerment in developing countries. However, when one thinks of Africa, robotics does not spring immediately to mind as the most relevant application of AI, considering that the continent typically has high unemployment and fast-growing populations. Nevertheless, some countries in Africa have embraced robotics on the basis that it has an important role to play in their economic development. In this article, we explore this role and the ways in which Africa can best exploit the opportunities afforded by intelligent automation and robotics. It also highlights strategies to offset the threats posed by global factors, such as premature deindustrialization.

The Growing Impact of AI in Africa

There is an increasing awareness of the positive impact that AI will have on developing countries, including sub-Saharan Africa, in sectors such as agriculture, health care, and public and financial services [1]. AI has the potential to drive economic growth, development, and democratization, thereby reducing poverty, increasing education, supporting health-care delivery, increasing food production, expanding the capacity of the existing road infrastructure by increasing traffic flows, improving public services, and bettering the quality of life for people with disabilities [2]. AI can empower workers at all skill levels to be more competitive [3], [4]. Specifically, it can be used to augment and enhance human skills—not to replace or displace humans—and to do so at all levels, enabling average and low-skill workers to fit better in high-performance environments and take on more complex responsibilities.

Africa's biggest economic challenge is to equip large sections of its economy with average workers who are primed to perform tasks far better than most employees are currently managing to do. In South Africa, approximately 31% of employers cannot fill their vacancies [4]. AI will make technology easier to adopt and harness [1], [4]. In the health-care sector, AI helps address the shortage of doctors through telemedicine and access to medical supplies through drone deliveries [5]. In agriculture, AI (including machine learning, remote sensing, and data analytics) has the potential to improve productivity and efficiency at all stages of the value chain, enabling small-holder farmers to increase their income through higher crop yields and greater price control, detect and precisely treat pests and diseases, monitor soil conditions and target fertilizer applications, create virtual cooperatives to aggregate crop yields, broker better prices, and exploit economies of scale. Internet of Things (IoT) platforms may offer cost-effective ways to achieve those benefits [6]. For example, Microsoft is applying its Farmbeats platform [7] in developing countries by lowering the cost associated with densely deploying sensors, exploiting sparsely distributed sensors and aerial imagery to generate precision maps, and replacing expensive drones with smartphones attached to hand-carried, low-cost, tethered helium balloons [8].

Premature Deindustrialization

On the downside, factory and call-center work will slow as tasks are replaced by AI-enabled automation, including robots, which will add pressure to unemployment rates that are already high in developing countries, including those in Africa [5]. This will be exacerbated by growing populations, reducing opportunities still further. Africa's population is large and expanding fast: most of its people are young and urban with a median age of 19.5 years, compared to Germany (47.1), the United States (38.1), and China (37.7), and the youth population is set to reach 225 million by 2055 [5]. Kenya, Nigeria, and South Africa, for example, are projected to have approximately 5.5%, 8.5%, and 12.5%, respectively, of their workforce displaced by automation [9]. A report by the Oxford Martin School at the University of Oxford, United Kingdom, and Citigroup, New York, summarizes the situation in Africa in stark terms [10]:

> In most of sub-Saharan Africa, the manufacturing share of output has persistently declined over the past 25 years. The share of jobs in manufacturing is even smaller: just over 6% of all jobs. This figure barely changed over the course of the three decades

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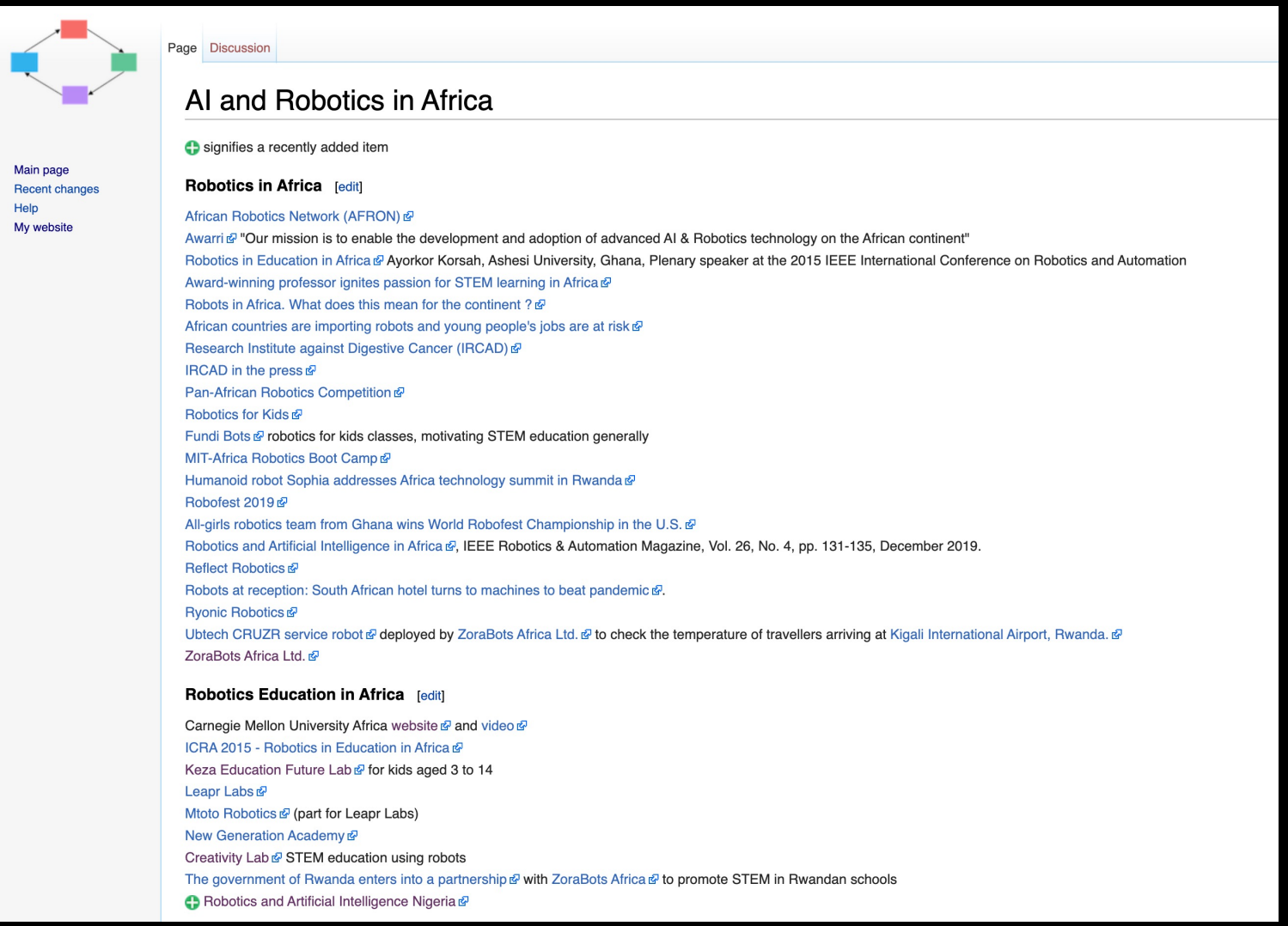
Date of current version: 11 December 2019

IEEE Robotics and Automation Magazine

https://ieeexplore.ieee.org/document/8931075



Main page
Recent changes
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Page Discussion

AI and Robotics in Africa

signifies a recently added item

Robotics in Africa [edit]

African Robotics Network (AFRON)
Awarri "Our mission is to enable the development and adoption of advanced AI & Robotics technology on the African continent"
Robotics in Education in Africa Ayorkor Korsah, Ashesi University, Ghana, Plenary speaker at the 2015 IEEE International Conference on Robotics and Automation
Award-winning professor ignites passion for STEM learning in Africa
Robots in Africa. What does this mean for the continent ?
African countries are importing robots and young people's jobs are at risk
Research Institute against Digestive Cancer (IRCAD)
IRCAD in the press
Pan-African Robotics Competition
Robotics for Kids
Fundi Bots robotics for kids classes, motivating STEM education generally
MIT-Africa Robotics Boot Camp
Humanoid robot Sophia addresses Africa technology summit in Rwanda
Robofest 2019
All-girls robotics team from Ghana wins World Robofest Championship in the U.S.
Robotics and Artificial Intelligence in Africa, IEEE Robotics & Automation Magazine, Vol. 26, No. 4, pp. 131-135, December 2019.
Reflect Robotics
Robots at reception: South African hotel turns to machines to beat pandemic.
Ryonic Robotics
Ubtech CRUZR service robot deployed by ZoraBots Africa Ltd. to check the temperature of travellers arriving at Kigali International Airport, Rwanda.
ZoraBots Africa Ltd.

Robotics Education in Africa [edit]

Carnegie Mellon University Africa website and video
ICRA 2015 - Robotics in Education in Africa
Keza Education Future Lab for kids aged 3 to 14
Leapr Labs
Mtoto Robotics (part for Leapr Labs)
New Generation Academy
Creativity Lab STEM education using robots
The government of Rwanda enters into a partnership with ZoraBots Africa to promote STEM in Rwandan schools
Robotics and Artificial Intelligence Nigeria

Artificial Intelligence, Robotics, and Machine Learning in Africa

http://www.vernon.eu/wiki/AI_and_Robotics_in_Africa

Lots of inventive activities ...

But ...

The difference between Invention and Innovation
is Adoption

Jeremy Rose

Adoption depends on **trust**

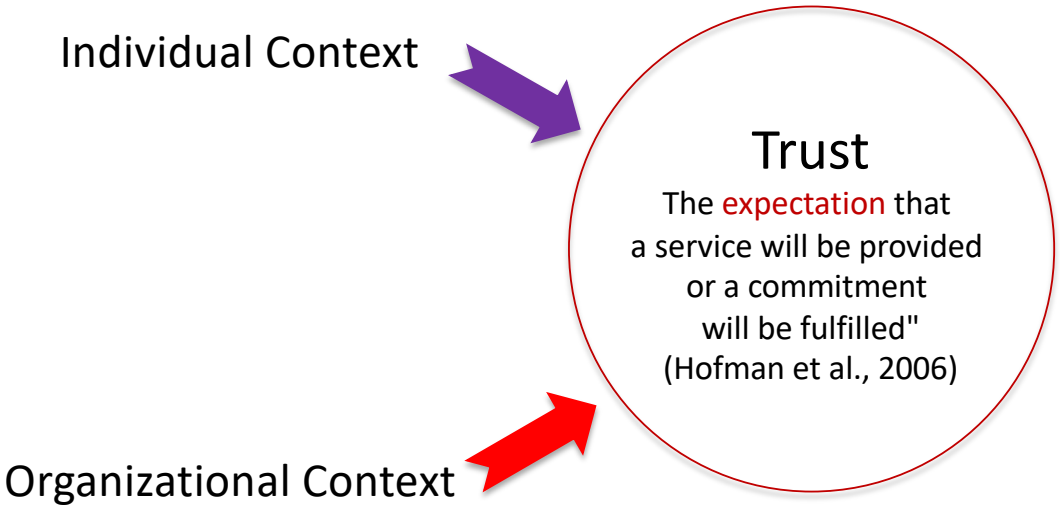
Trust

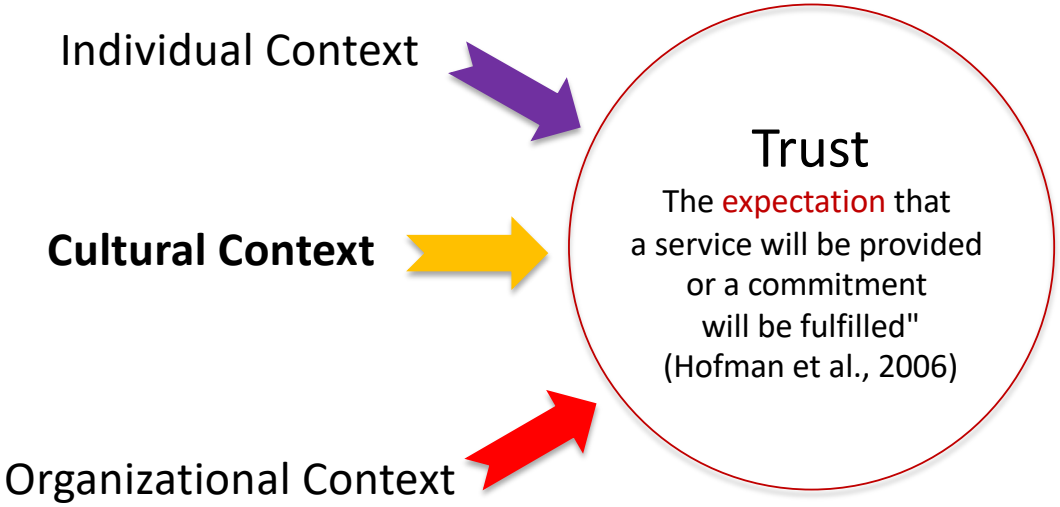
The expectation that
a service will be provided
or a commitment
will be fulfilled"
(Hofman et al., 2006)

Individual Context

Trust

The expectation that
a service will be provided
or a commitment
will be fulfilled"
(Hofman et al., 2006)


Individual Context
Trust
The expectation that
a service will be provided
or a commitment
will be fulfilled"
(Hofman et al., 2006)
Organizational Context


Individual Context
Cultural Context
Organizational Context
Trust
The expectation that
a service will be provided
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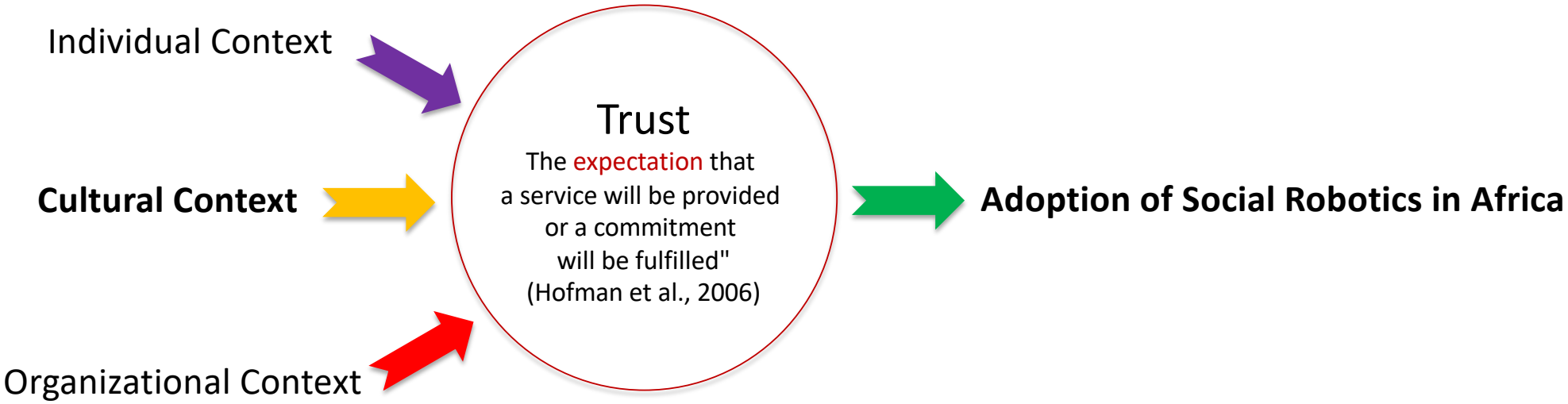
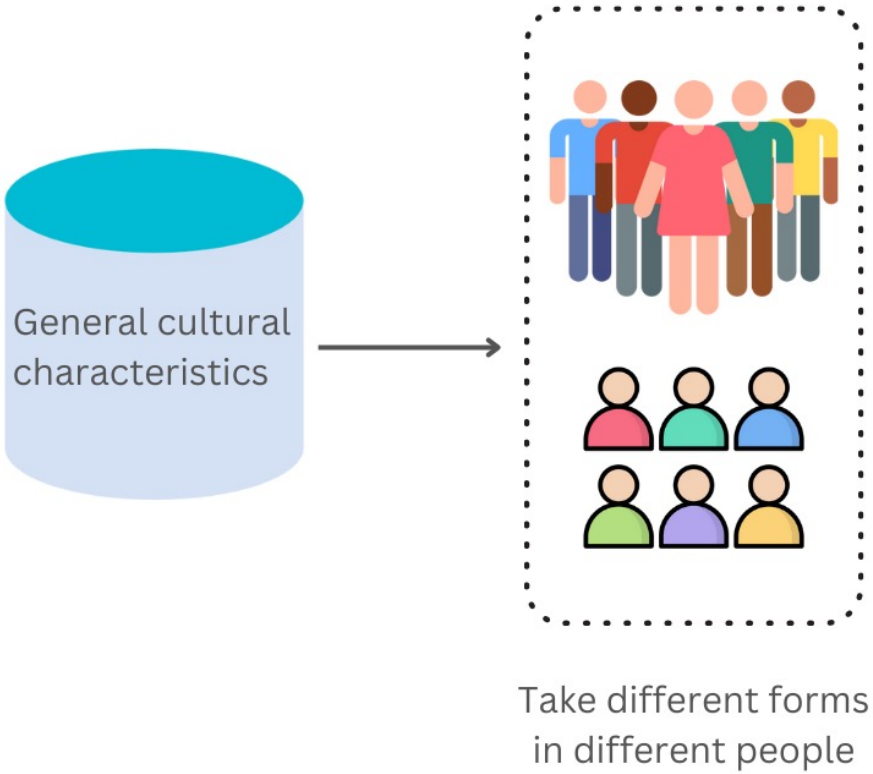
will be fulfilled"
(Hofman et al., 2006)


Individual Context
Cultural Context
Organizational Context
Trust
The expectation that a service will be provided or a commitment will be fulfilled" (Hofman et al., 2006)
Adoption of Social Robotics in Africa

Adoption hinges on cultural competence

Graphic based based on work by Bruno et al. (2017)



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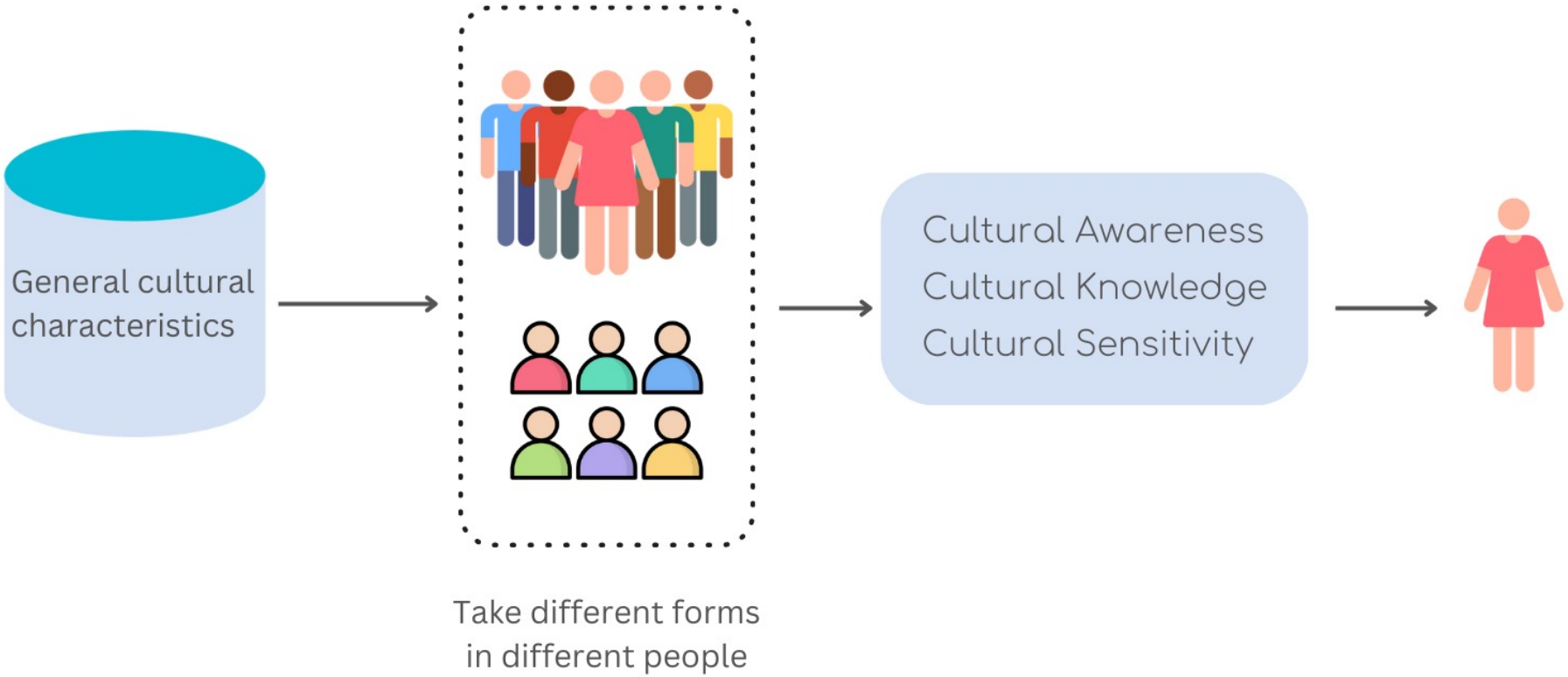

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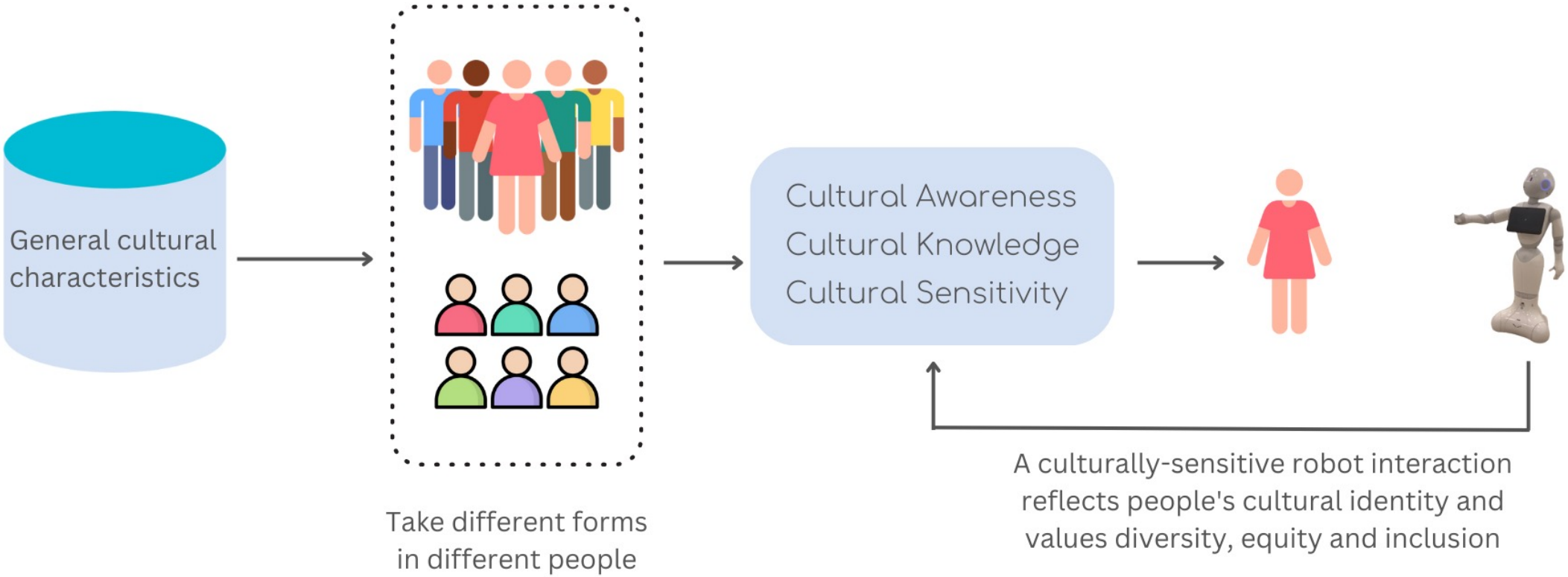

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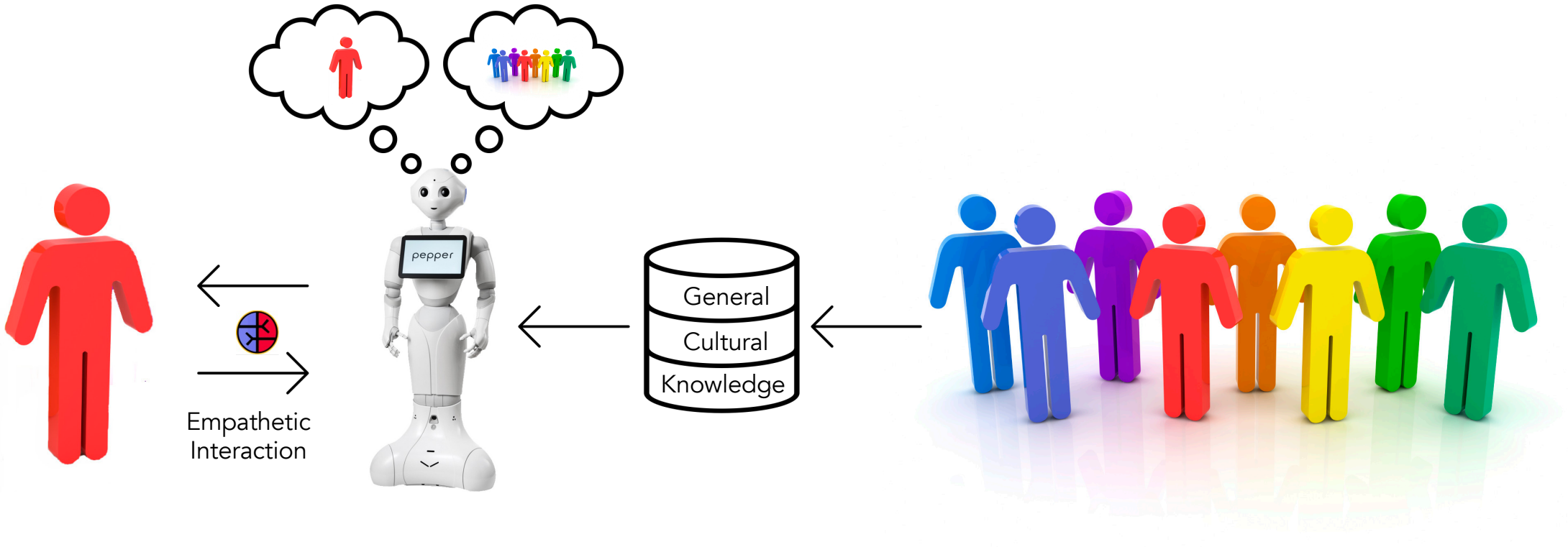


Graphic based based on work by Bruno et al. (2017)

Culturally Competent Social Robot

{Bruno et al, 2017}

Cultural knowledge representation

Culturally Competent Social Robot

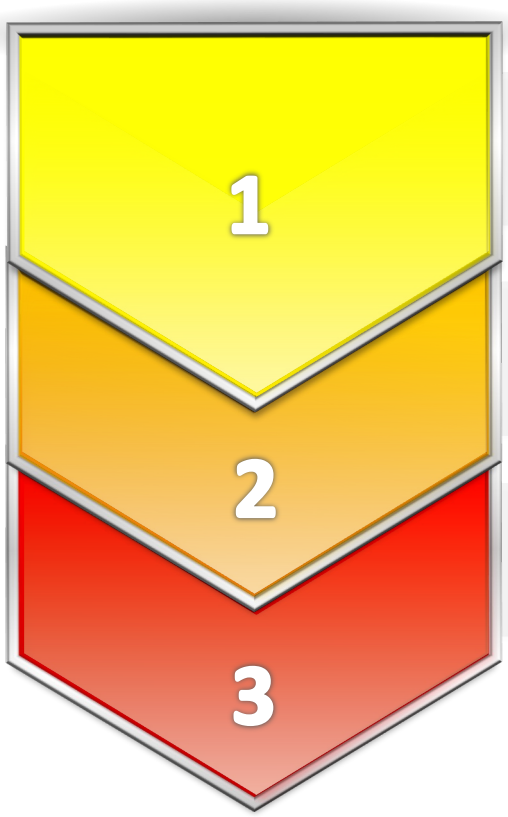
{Bruno et al, 2017}

Cultural knowledge representation

Culturally sensitive planning and action execution

Culturally Competent Social Robot

{Bruno et al, 2017}



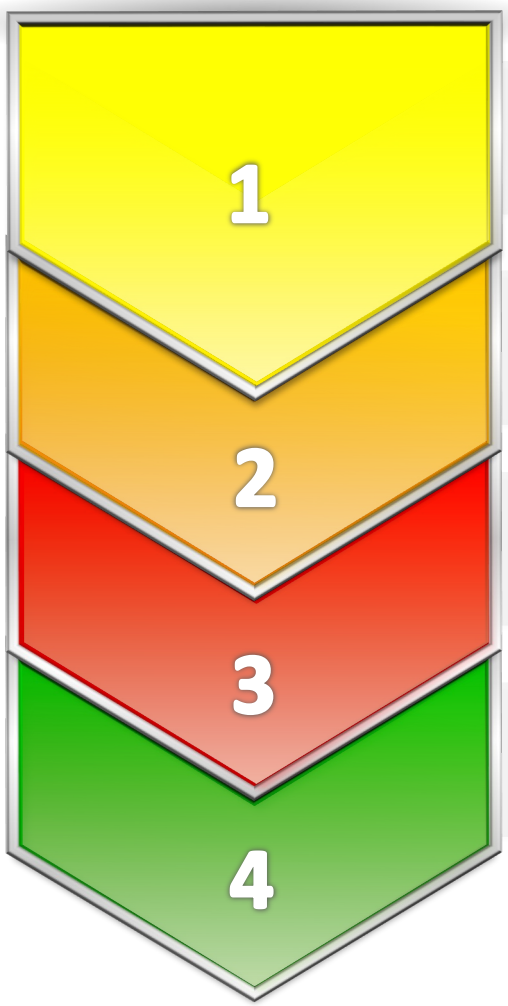
Cultural knowledge representation

Culturally sensitive planning and action execution

Culturally aware multimodal human-robot interaction

Culturally Competent Social Robot

{Bruno et al, 2017}



Cultural knowledge representation

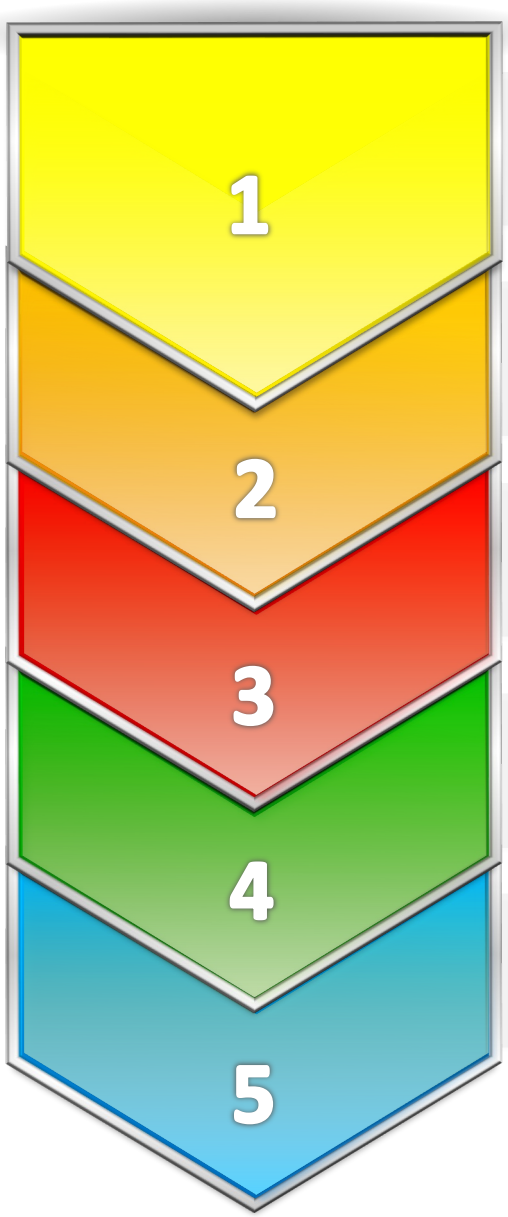
Culturally sensitive planning and action execution

Culturally aware multimodal human-robot interaction

Culture-aware human emotion recognition

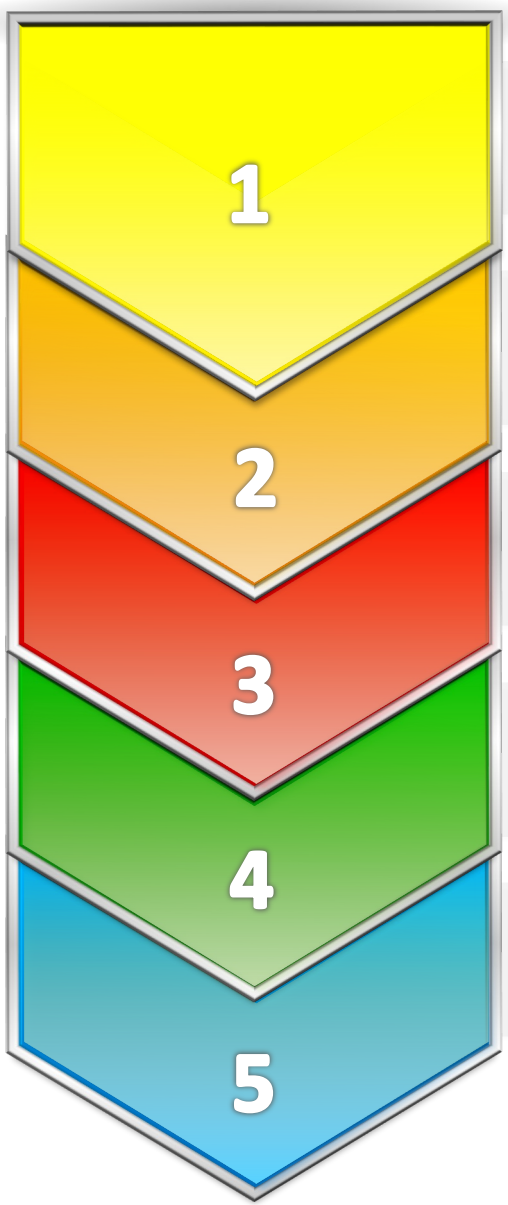
Culturally Competent Social Robot

{Bruno et al, 2017}



1. Cultural knowledge representation
2. Culturally sensitive planning and action execution
3. Culturally aware multimodal human-robot interaction
4. Culture-aware human emotion recognition
5. Culture identity assessment, habits, and preferences

Culturally Sensitive Social Robot



Cultural knowledge representation

Culturally sensitive planning and action execution

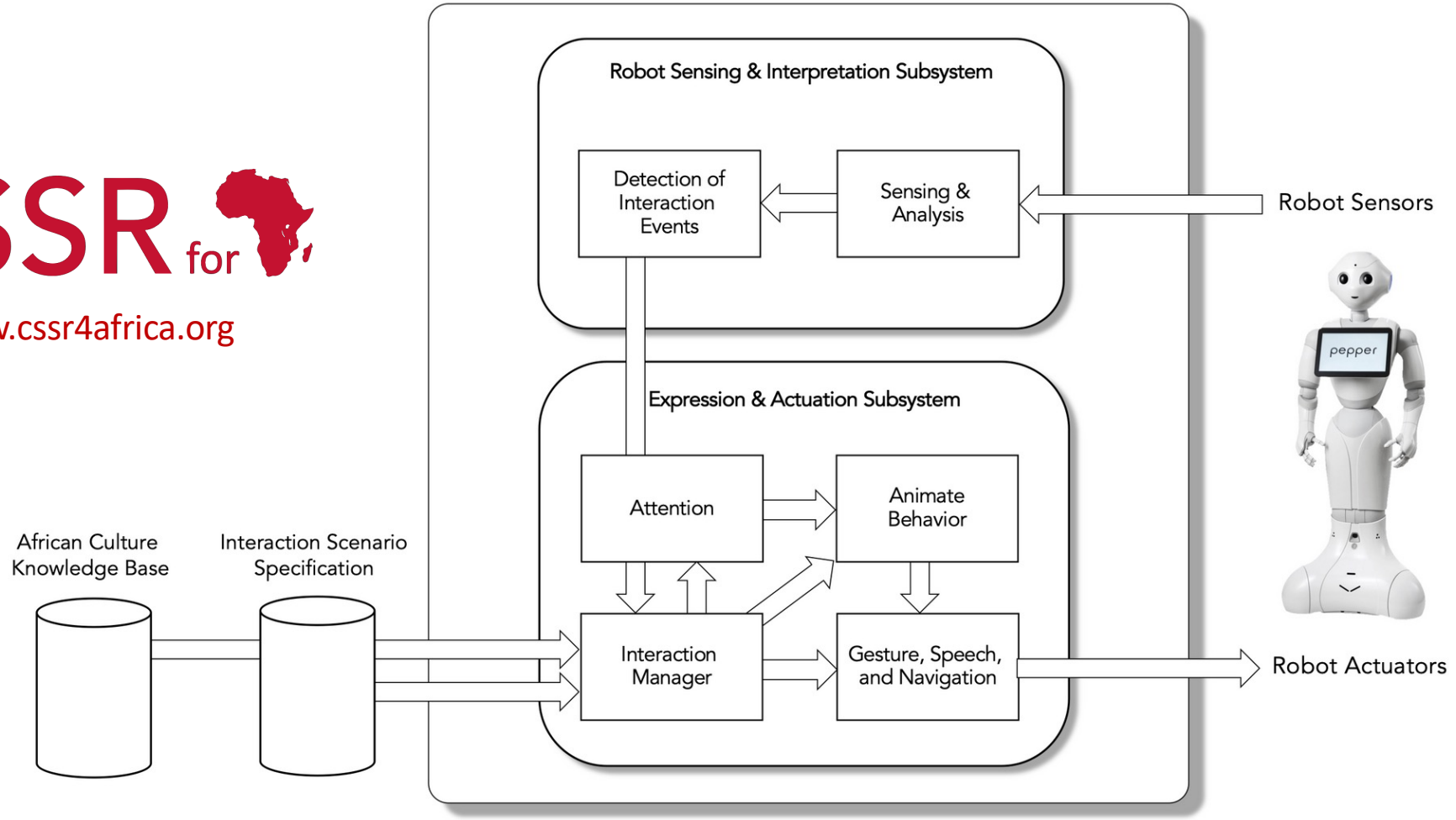
Culturally aware multimodal human-robot interaction

Culture-aware human emotion recognition

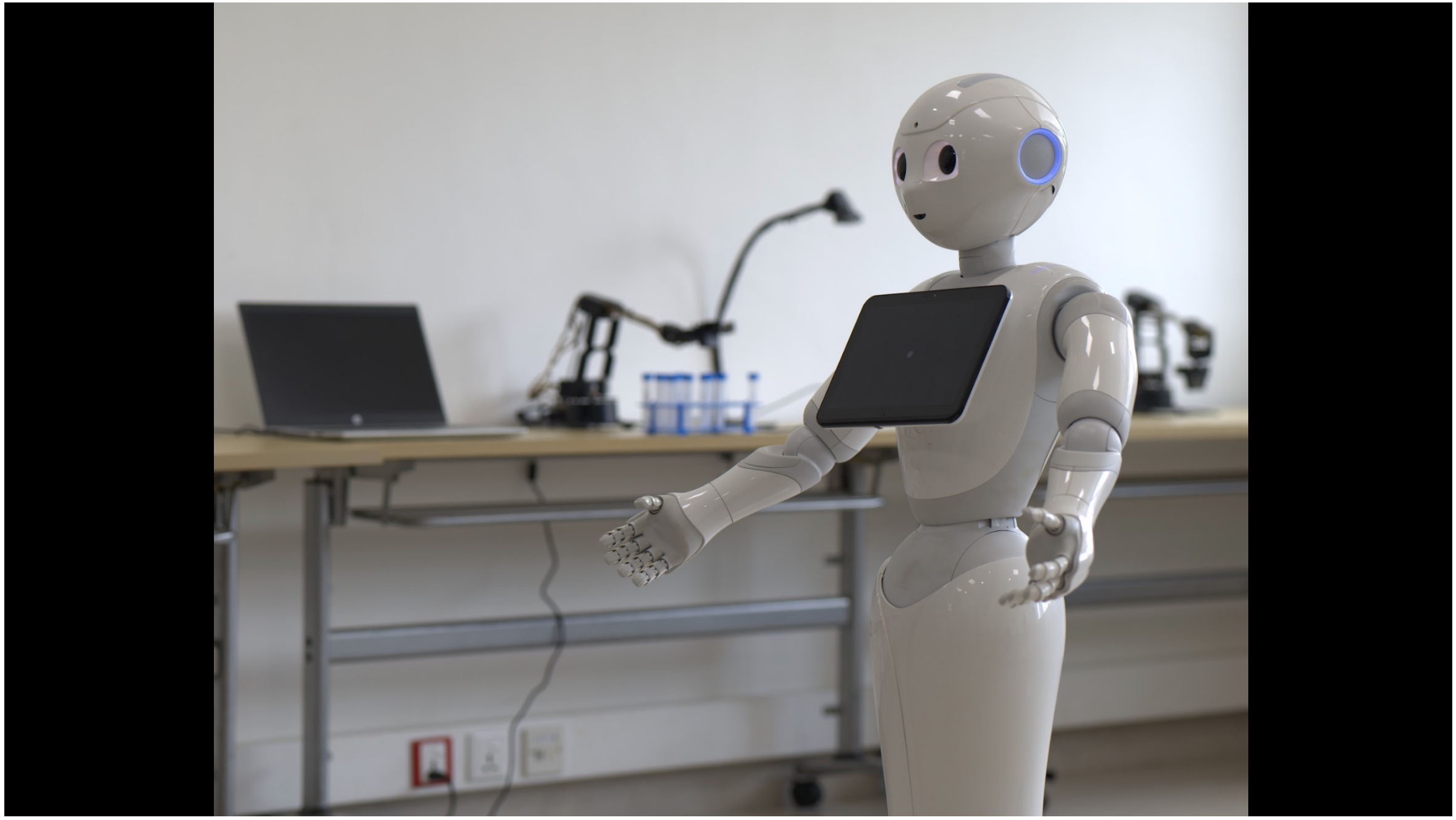
Culture identity assessment, habits, and preferences

CSSR for

www.cssr4africa.org



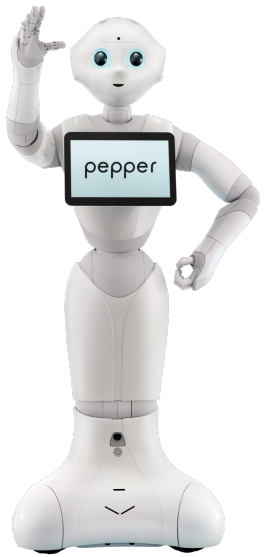
System architecture of the different elements for culturally-sensitive human-robot interaction



A Sample of African Culture-specific Knowledge

No.	Socio-cultural Norm or Trait
1	All interactions should begin with a courteous greeting.
2	The younger interaction partner should enable a greeting to be initiated by an older person.
3	The younger interaction partner should bow when greeting an older person or when rendering a service.
4	One should not wave at someone from a distance; one should move towards them to greet them.
5	To show respect, one should bow slightly and lower gaze when greeting someone older.
6	To show respect, one should raise both hands and lower gaze a little when greeting.
7	One should suspend work or movements and pay attention when addressed.
8	One should use an open palm of the hand to point to people and objects.
9	One should not point an upward facing palm of the hand at someone.
10	One should not use the left hand to point to anything.
11	One should not use the left hand to hand something to someone.
12	To show respect, one should hand over and accept gifts with two hands and do so from the front, facing the recipient.
13	It is respectful to use local languages and they should be used for verbal interaction when possible.
14	One should use formal titles when addressing someone.
15	One should engage in a preamble before getting to the point, as being too forward may be regarded as disrespectful.
16	One should not interrupt or talk over someone when they are speaking.
17	One should not interrupt or talk over someone when they are speaking.
18	One should keep intermittent eye contact; lack of eye contact depicts disrespect as it shows divided attention during the interaction.
19	One should not make persistent eye contact with an older person.
20	One should not make eye contact when being corrected.
21	To show respect, one should shake hands with the right hand and use the left arm to support the right forearm when doing so.
22	One should not walk far ahead of an older person, unless leading the person (in which case, one should walk slightly to the side).
23	One should not walk between two or more people who are conversing; it is considered rude to do so.
24	An appreciation of rhythmic sound and movement is valued.
25	Behaviours should focus on fostering social connections and relationships; they should not be purely functional.

After {Bruno et al, 2019}



Spatial, Non-verbal, Verbal Interaction

Design Pattern	Culturally Competent Behavior
Initial Introduction	The robot should acknowledge the presence of the person. The robot should initiate an interaction with a slight bow. The robot should greet first and should use a formal greeting. The robot should respect personal and intimate distances during interaction.
Reciprocal Turn Taking	The robot should respectfully give the initial turn to the human interaction partner. The robot should give priority to older people; it should not interrupt and it should let the other person finish their turn.
Didactic Communication	Pointing a hand directly at someone is disrespectful. For deictic gestures, the robot should use its left hand. The robot should gesture with an open palm rather than pointing a finger.
Personal Interests and History	The robot should avoid trying to share personal history since it will be perceived to be inauthentic. The robot should focus on and highlight its functional usefulness.
In Motion Together	The robot should explicitly say "Please come along" to remove any ambiguity of intention. The robot should not walk too far ahead when showing the way.
Recovering from Mistakes	The robot should apologize profusely. The robot should slightly bow when introducing itself and after it makes a mistake.
Physical Intimacy	Personal space should be entered only with prior consent. The robot should not pass in between two people that are interacting.
Claiming Unfair Treatment or Wrongful Harm	To enhance the perception that the robot is being respectful, the robot should not be aggressive by claiming unfair treatment.

A Sample of Africa-centric Design Patterns for Social Robots

After {Kahn et al, 2008}

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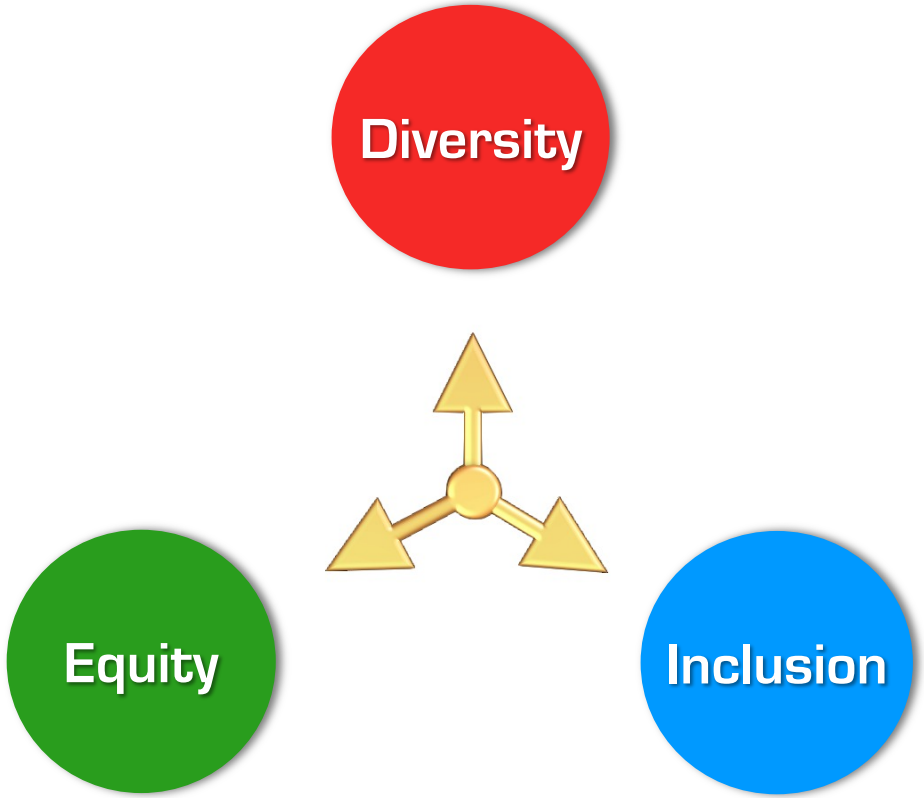
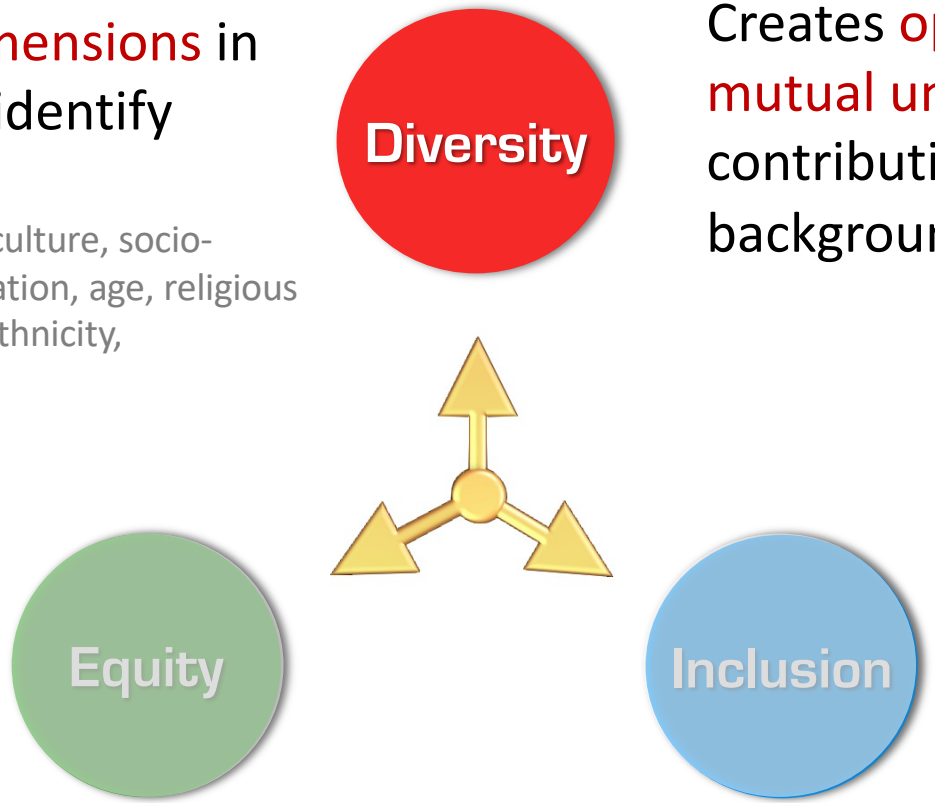

Diversity
Equity
Inclusion

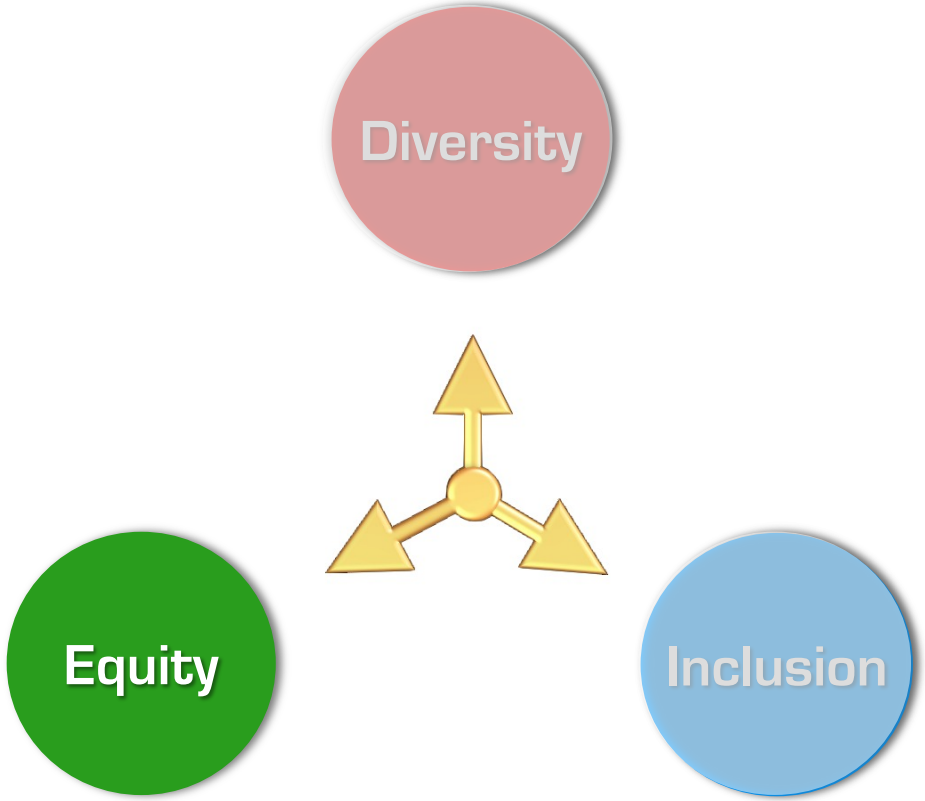
The many different dimensions in which people differ & identify

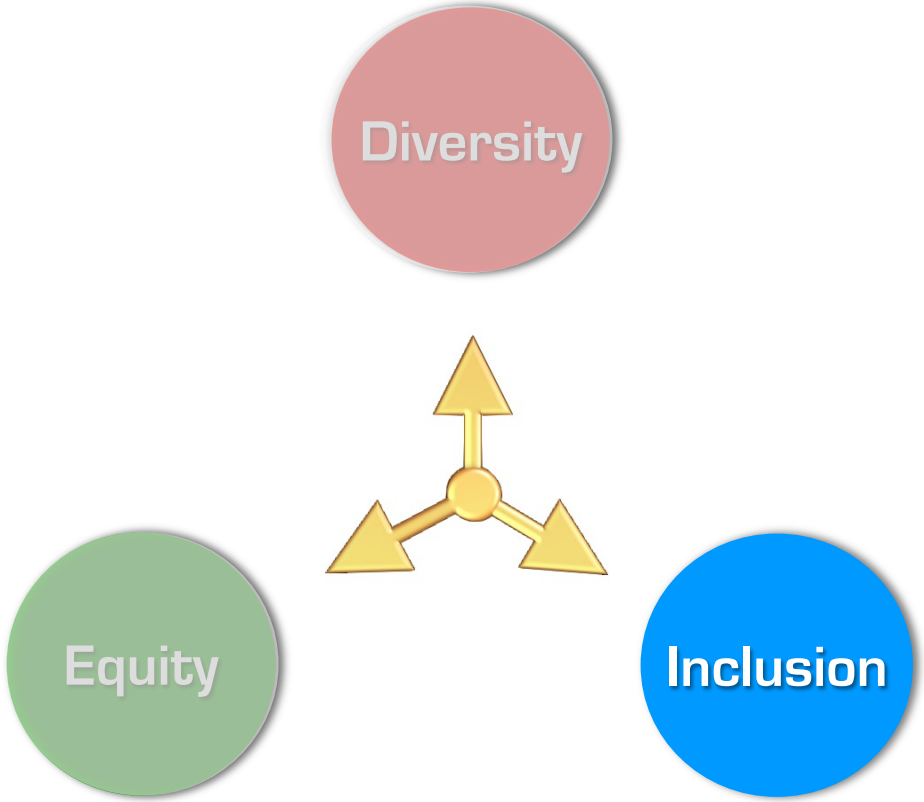
Gender, sexual orientation, race, culture, socio-economic status, traditions, education, age, religious and spiritual beliefs, nationality, ethnicity, experience, physical ability



Creates opportunities for greater mutual understanding of the contribution that a person of each background can make

It is the act of empowering, the process that leverages the potential latent in diversity





Means that each person feels they belong in that environment and that their place is valued

This is the achieved by empathy

"The highest form of knowledge is empathy,
for it requires us to suspend our ego and live in another's world"

George Eliot

Pen name of Mary Ann Evans

"The highest form of knowledge is empathy,
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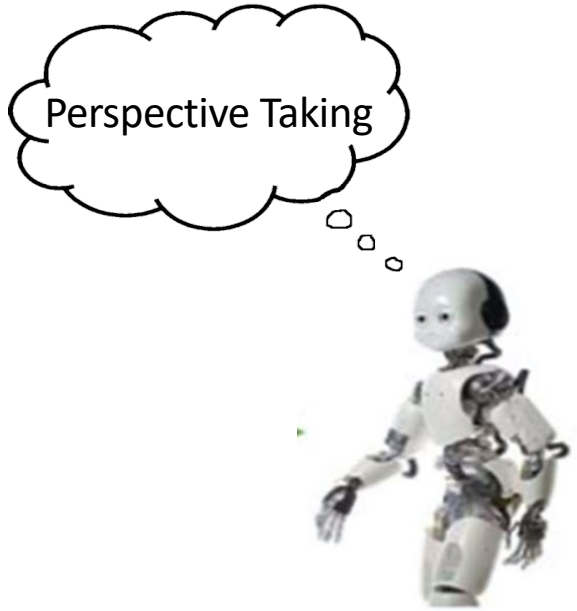

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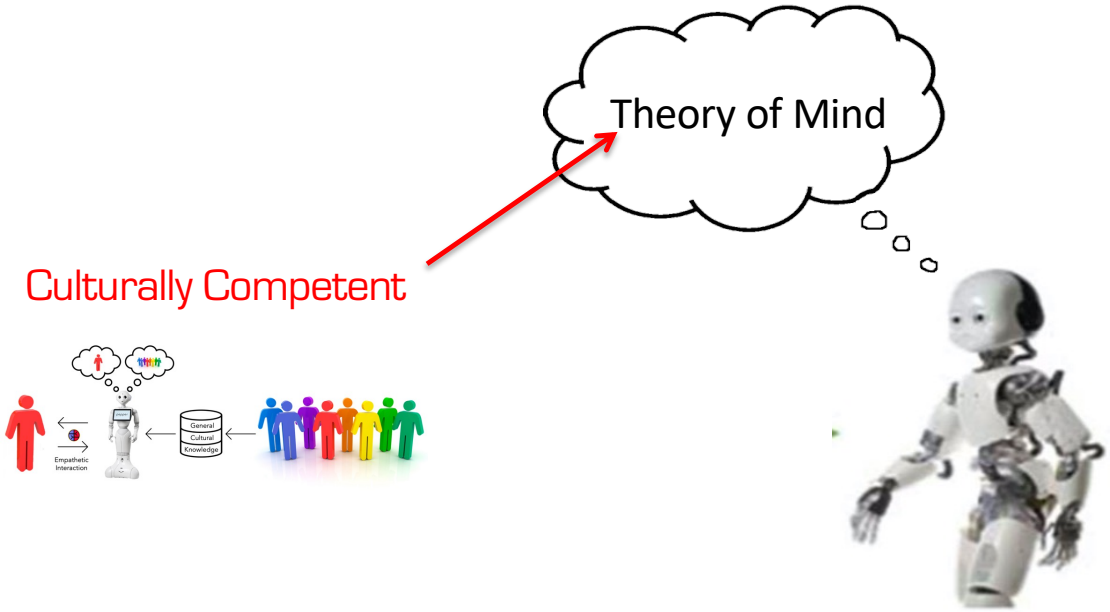
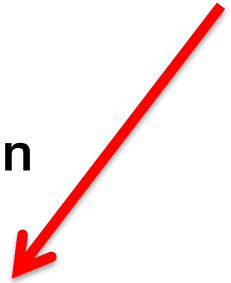


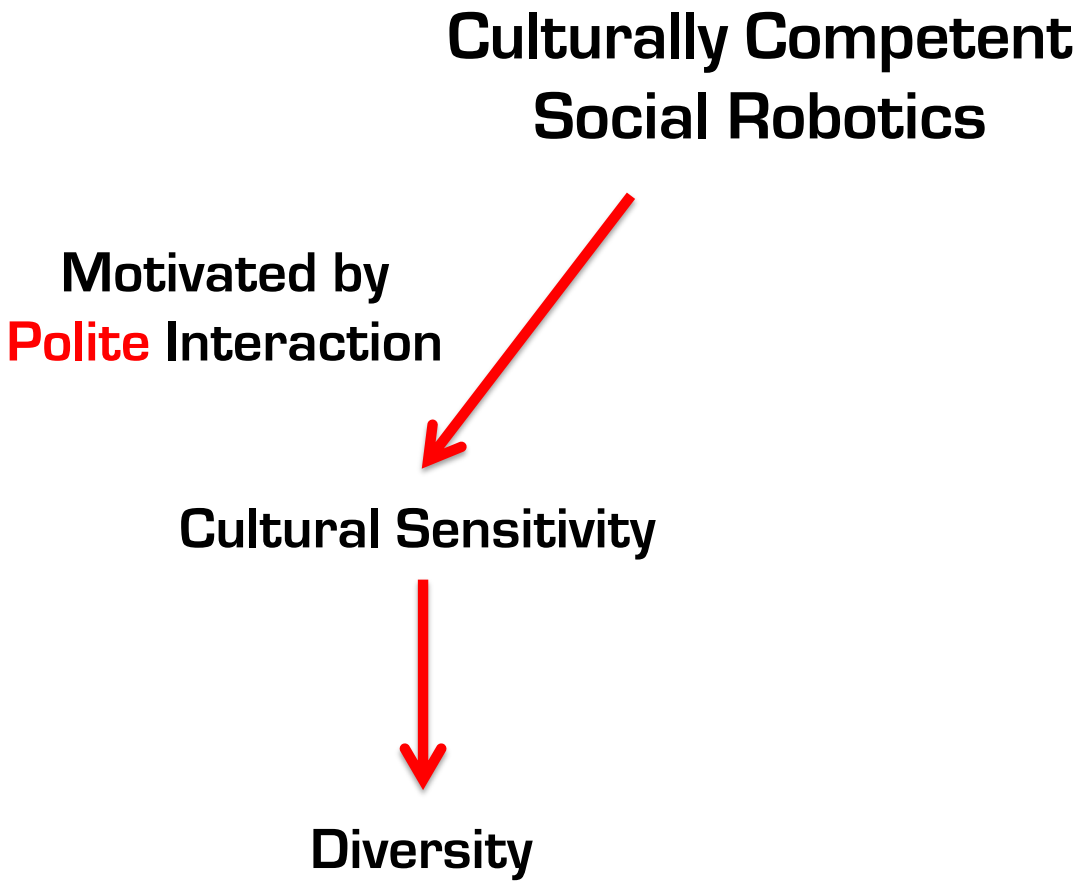
Culturally Competent Social Robotics

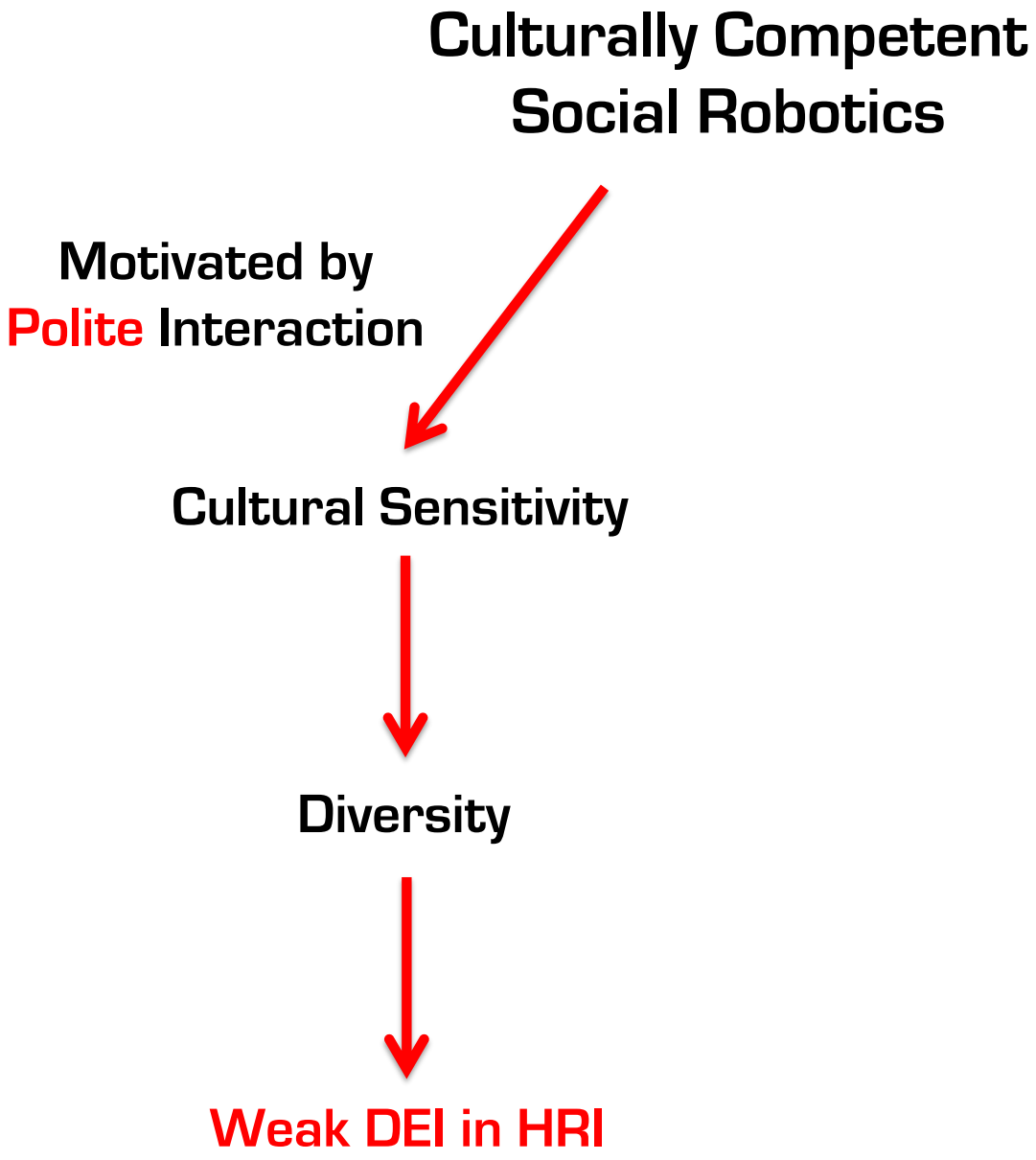
Culturally Competent Social Robotics

Motivated by
Polite Interaction



Cultural Sensitivity


Culturally Competent
Social Robotics
Motivated by
Polite Interaction
Cultural Sensitivity
Diversity


Culturally Competent
Social Robotics
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Weak DEI in HRI

Culturally Competent Social Robotics

Motivated by Polite Interaction

Motivated by Respectful Interaction

Cultural Sensitivity

Empathy

Perspective Taking

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Weak DEI in HRI

Culturally Competent Social Robotics

Motivated by Polite Interaction

Cultural Sensitivity

Diversity

Weak DEI in HRI

Motivated by Respectful Interaction

Empathy

Perspective Taking

Inclusion

Strong DEI in HRI

DEI is an ethical imperative

DEI in HRI empowers the individuals with whom the robots interact

by actively valuing the cultural heritage of those individuals

THANK YOU!

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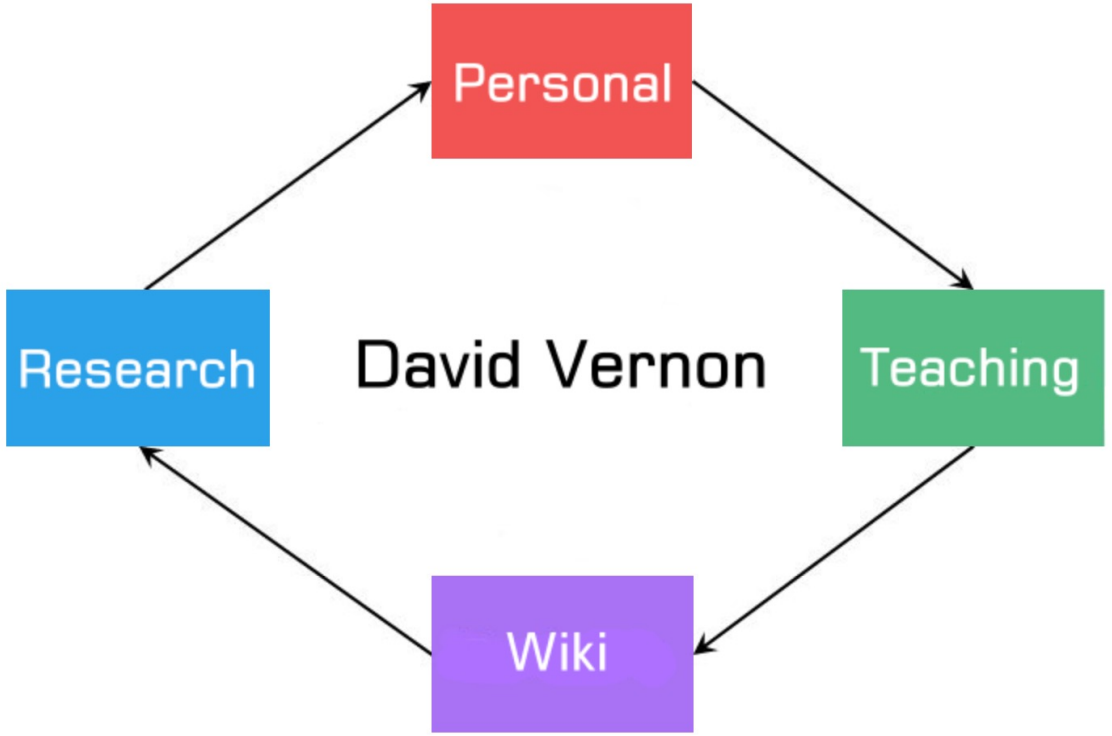

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Workshop on
Culturally Sensitive Social Robotics for All

Abu Dhabi 2023
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21st International Conference on Advanced Robotics
Abu Dhabi, UAE
5th December 2023

The Importance of Cultural Competence for Diversity, Equity, and Inclusion

David Vernon

Carnegie Mellon University Africa

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