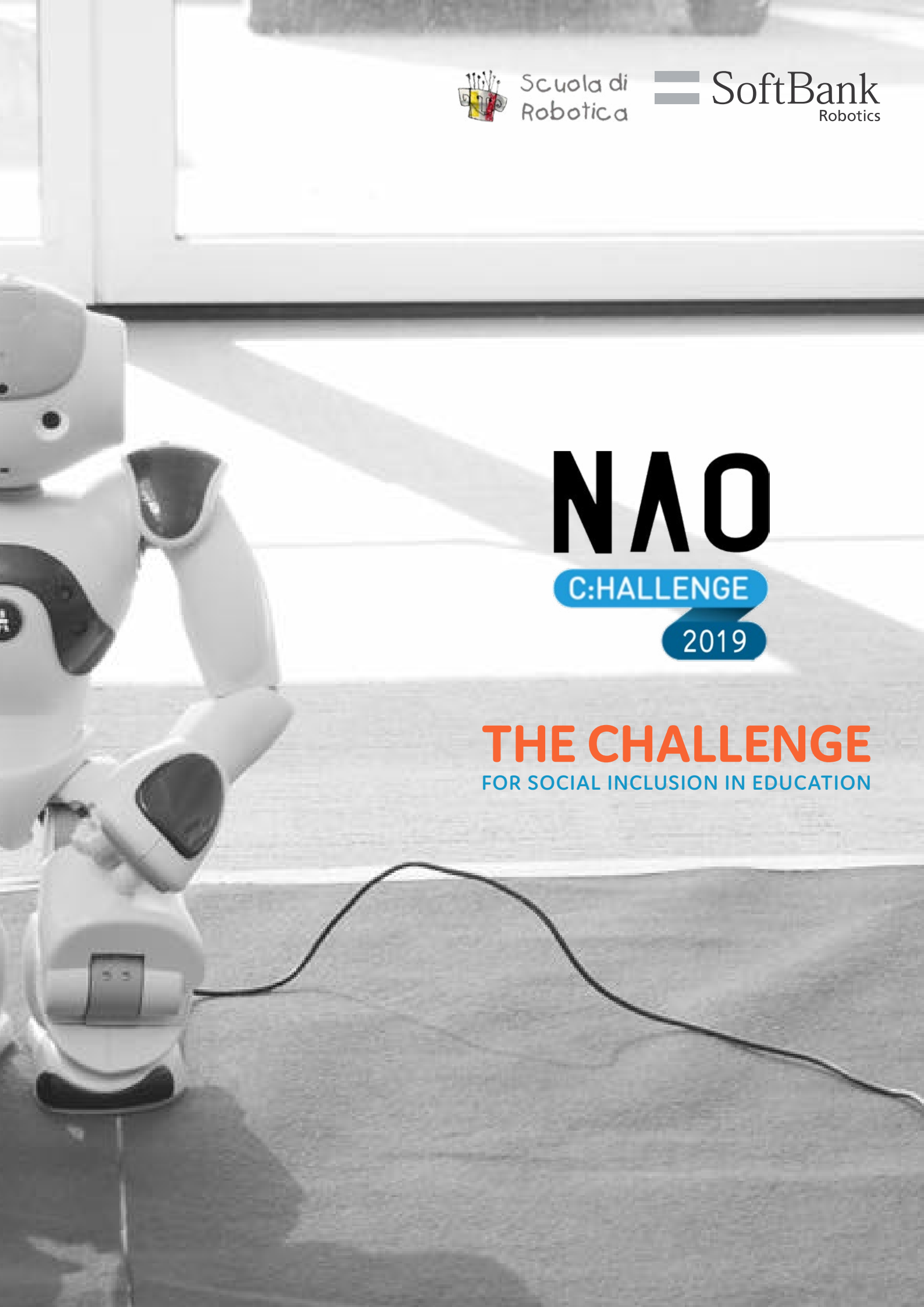

Scuola di Robotica
SoftBank Robotics
NAO
C:HALLENGE
2019
THE CHALLENGE
FOR SOCIAL INCLUSION IN EDUCATION

NAO CHALLENGE

We are living a charming and intriguing world in which, in the nearby future, robots will be companions of our daily life. Humanoid Robots is a sector in continuous expansion and a great opportunity from the working point of view.

NAO Challenge is an annual competition organized by Scuola di Robotica, in cooperation with SoftBank; it started in France in 2014, and in Italy in 2015 here becoming the world greatest humanoid competition for high-school students. Main aim is to raise awareness of the benefits of learning informatics and technology by motivating and teaching students on a humanoid robot.

Programming and developing a mechatronic system, teams will create sceneries to optimize NAO's capabilities, while taking into account its limits and so developing skills which will be essentials to their future working lives.

NAO C:HALLENGE 2019

Scuola di Robotica

SoftBank Robotics

School of Robotics is not a traditional school, with classrooms, desks and blackboards. We are a non-profit association with a goal to modernize educational content and methods. We want to promote the knowledge and application of robotics as a teaching technology in the existing educational and training structures.

Since September 2009, we have been included among the subjects that provide training for the staff of the MIUR Training School-Teacher and collaborate with all the Italian schools to experiment with new online activities. a Distributed Virtual Laboratory. School of Robotics is also the NAO Challenge Ambassador for Italy, among many other collaborations.

The Nao Challenge is an annual event for high schools organized by the School of Robotics, in collaboration with SoftBank Robotics, with the aim of increasing the students' skills in the use of humanoid robotics thanks to the use of multi-technological and innovative projects.

The national competition tests the skills of students through the acquisition of technical skills, programming and development of problem solving skills. It has grown in a short time to become the contest dedicated to humanoid robotics for the largest schools in the world.

The fourth edition, NAO CHALLENGE 2018, was organized with the support of the Golinelli Foundation, Campus Store and Bip - Business Integration Partners, Web Marketing Festival and various venue partners.

To increase the complexity of the competition every year the themes are changed with the aim of exploring the potential of humanoid robots in many sectors of everyday reality. During this edition the teams were to find a solution to use the humanoid robot Nao as part of daily activities aimed at supporting independent living by the elderly. As part of the event, the School of Robotics also promoted a series of free educational workshops and courses for adults and children.

99
TEAMS

805
PARTICIPANTS

55
SCHOOLS

5
COURSES

80
JUDGES

10
SPONSORS

6
SEMI FINALS

1
FINAL

813 followers
1600 posts of #NAOCHALLENGE2018
Average total reach = 700
Average post reach = 500

31.747 followers
1600 posts of #NAOCHALLENGE2018
Average total reach = 3.216
Average organic post reach = 1.073
Average paid post reach = 9.422

The semi-finals in this edition, were held in Genova, Messina, Pozzuoli, Firenze, Udine and Bolzano. The final was held in Bologna. As is visible, we were able to gain a large reach and participation for the challenge from various different schools from different regions and cities. This reach not only helped initiate a chain effect to gain knowledge about the competition, but also gain knowledge of our sponsors. The promotions were done using various hashtags and location tags. The reach is mostly targeted, with the main a division of target between students, teachers and parents,

The competition has grown multi-folds throughout the editions and we wish to continue this growth. We also wish to expand our current reach on social media through targeted Facebook marketing and SEO techniques. We also wish to grow the webinars in number, the courses conducted and eventually form an ecosystem of loyal participants and supporting partners to be able to introduce NAO Challenge as a Europe-wide challenge.

Scuola di Robotica with the help of existing and new sponsors, wishes to expand the NAO Challenge to the entirety of Europe as a Humanoid Challenge. The estimated expenses and the sponsorship packages that can be employed are given below, however, we will be open to forming new sponsorship packages if the sponsor's goals align with ours.

A GREAT OPPORTUNITY

For Students:

* To acquire technical and coding competences.
* To develop ability in Problem Solving and organizational team work skills.
* To develop creativeness and communication skills: all skill levels are welcomed and needed, technical or non-technical.
* To discover promising professions and careers.
* To be involved in the development of robots which will be partners and assistants in our everyday life thanks to software to be used daily.
* To become part of a community of innovators and developers in new Technologies.

For Teachers:

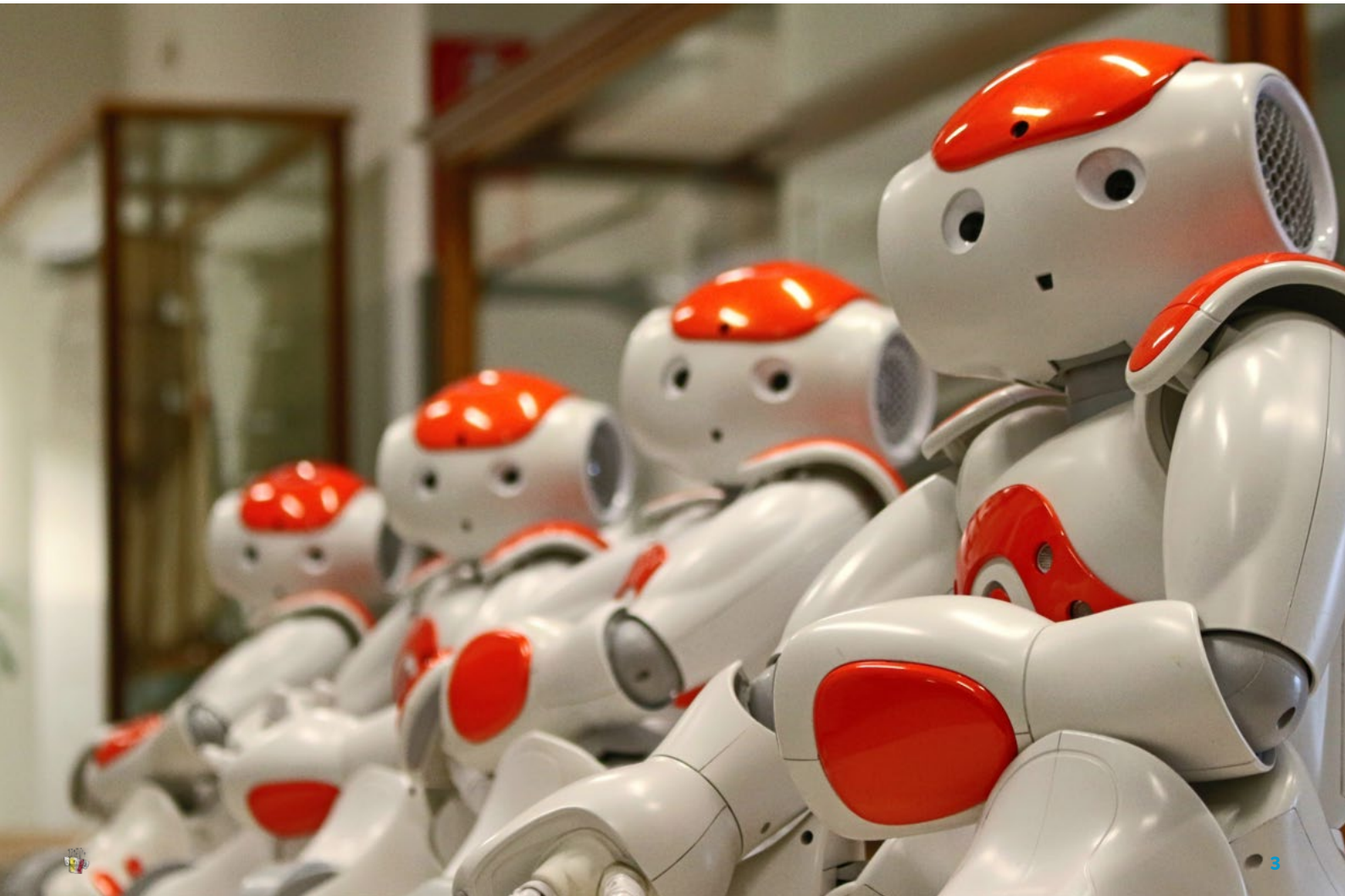
* Increase students' interest in STEM skills;
* Experience an effective way of flexible teaching.
* Coaches will be offered classroom and online courses on humanoids robots

For Schools :

* A tool to promote on international media values of innovation and excellence that characterize the institution.

For All :

* The opportunity to meet NAO's users community in addition to technicians and engineers
* teams that will offer a special assistance all through the contest.
* Discovery of robotic fascinating world and the sense of initiative and entrepreneurship that
* characterize it, a world where sense of humor is connected with creativity and passion.



TEAMS

Registration is reserved to high school teams. (no private teams shall be admitted) Every high school institution can enroll more than 1 team.

A team must have a minimum of 3 and a maximum of 10/12 (if ASL?) students and is trained by a teacher*.

IT IS NOT REQUIRED TO HAVE A NAO TO TAKE PART IN THE CHALLENGE

The Challenge provides for two categories of team:

* Teams WHICH DO NOT OWN NAO
* Teams WHICH OWN NAO

The two categories are judged separately during semi-finals and National Final.

Teams which DO NOT OWN NAO

Preparing for the tournament

Teams will work on NAO simulation software and will have the possibility to test their programs on a physical NAO.

The organization of how NAOs will be made available by SoftBank Robotics Europe in Hosting Centers will be published later on.

If it should be impossible to the team to use NAO in a Hosting center, some tests shall be made through remote connection with technical team of Scuola di Robotica.

Day of the tournament

Teams will receive from Ambassador a NAO they will use for tests and competitions.

TEAMS THAT OWN NAO

Preparing for the tournament

Teams will work on NAO owned by their school.

Day of the tournament

If the school has more than 1 team playing on the same day, teams will receive from Ambassador a NAO they will use for tests and competitions. To be eligible for awards, at the tournaments teams are asked to present in all 3 juries.

ONLY for Italian teams

WORK LINKED TRAINING PROJECT

For Participants to NAO CHALLENGE hours spent in preparing for tournaments can be considered work linked training hours. (have students have to get 400 hours of training along their last 3 years of secondary school).

*every teacher can coach a maximum of 3 teams ITALY

NAO FOR SOCIAL INCLUSION IN EDUCATION

SCENARIO

Humanoids are integral part of our daily life.

In this season NAO is asked to help us to improve inclusion in education.

What is inclusion?

Inclusion can be defined as the act or state of being part of something larger. In a social context inclusion means every person has the possibility to participate fully and equally in all social Processes - right from the beginning and regardless of individual skills, ethnic or social origin, sex or age. "Inclusion is something which cannot be done to people, it is something in which people are actively involved" (Norwich, 1999). By valuing and respecting human diversity, the practice of inclusion fosters a sense of community and belonging, enabling all people to participate in every area of life.

What is inclusion in education?

Educationally inclusive institutions are ones in which the learning, achievements, attitudes and well being of all learners matter. They are able to engender a sense of community and belonging, and also offer new opportunities to learners who may have experienced previous difficulties. This does not mean that they treat all learners the same way. Rather, it involves taking account of learners' varied life experiences and needs. Educational inclusion is about equal opportunities for all learners, whatever their age, gender, ethnic origin, religious belief, care status, impairment, sexuality, attainment or social or economic background. It pays particular attention to the provision made for, and the achievement of, different groups of learners. However, it also goes much further, and is about tackling the underachievement and exclusion of groups who have been marginalized or disadvantaged in the past, through taking positive action and through the targeting of resources to ensure that they have their rights upheld". OFSTED (2000).

RESOURCES TO START

https://www.youtube.com/watch?v=8HPh4RoV63s

https://www.esteri.it/mae/resource/doc/2016/07/ed_inclusiva_english.pdf

https://www.dvv-international.de/adult-education-and-development/editions/aed-782012/benefits-of-adult-learning-and-social-inclusion/benefits-of-adult-learning-and-social-inclusion/

A
HERE IS OUR TEAM

Students are asked to describe the team, its work, challenges faced and how problems have been overcome.

It is also important to underline members' roles in the team, and new skills acquired.

NAO will of course be part of the presentation!!

Teams are also asked to create a poster (70 cm x 90 cm), that will be exposed during the tournaments.

It will have to include at least the name and logo of the team.

On the website it will be available the template to be used by teams.

Evaluation parameters

* Team presentation.
* Team work.
* Team spirit.
* Use of NAO – software.
* Fun and originality.
* Poster.
* Demo.

B
NAO, CAN YOU HELP ME TO...?

The aim is to find an innovative hardware solution connected to NAO intended to help educators, teachers, parents.... to be fully inclusive in their educational activities.

Target groups can be any age (0 to 99 years old).

Goal for the challenge is to build a prototype and present one example of its usage to the jury.

Design and implementation of the project will have to be carried on by the teams, but, as always with NAO, everything will have to be funny and exciting!!

Teams will have to declare **target group** addressed and present the way they came to the Solution proposed (case study, experts activated, existing solutions...).

Scenario:

Teams will freely choose places of possible application of the solution.

Prototype requirements:

* connection to NAO
* at least 1 sensor. (any kind of object connected to NAO which is able to detect Data is considered a Sensor: ex. Phone)

Demo

Activity's demo will have to be interactive and involve NAO and at least one team member.

Evaluation parameters

Sources of information.

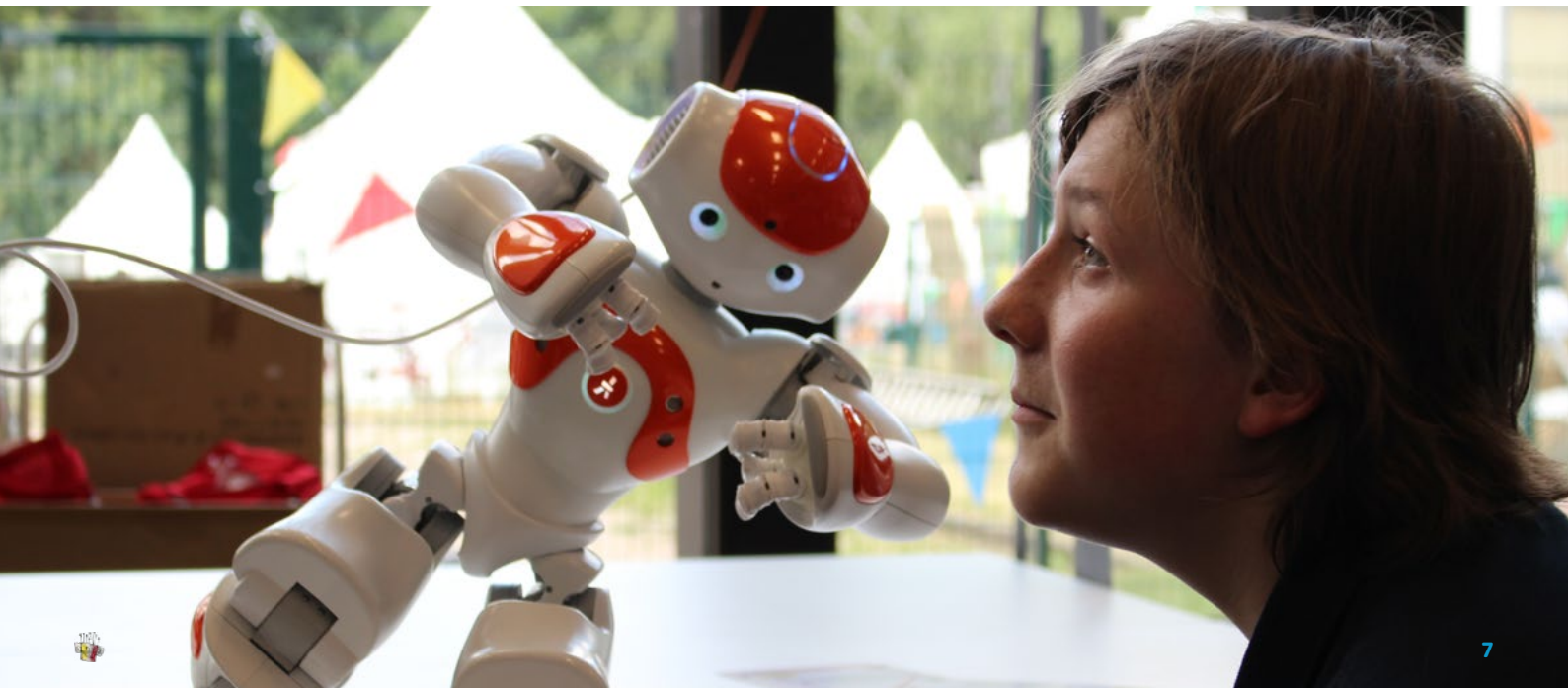
* Depth to which the problem was studied and analyzed by the team.
* Presentation of the solution and of project work.
* Innovation and feasibility.
* Connected Objects (innovation, quality of the prototype....)
* Software: technical choices, fluency, stability, dialogs, interactions.
* Demo – Design, fun, relevance, animations, accessories. Originality.
* Bonus: interaction with more than 1 person.

Internship project (Italy only):

* Feasibility study, market research.
* branding,

Only for TEAMS that OWN NAO

* Testing of the project on the ground (presented with foto, video ....)



C

NAO WE ALL LEARN!

Educators job is very hard and includes preparing different lessons for different child to be the most inclusive.

Autism spectrum disorder is one of educational areas where NAO is proved to have great results in improving teachers' job for inclusion.

One of difficulties for these students is to choose and ask for something. It has been proved that interaction with NAO is much easier. Students can start by exercising in asking to a Humanoid thus later be gradually used to make their request directly to their parents, teacher, class mates and finally any other person.

To make the exercise funnier and more exciting with NAO a teacher has invented a **" Choice RUN "**

The field:

3 to 6 lanes (according to space and number of teams in the tournament).

Each lane is 3,00 m long and 0,60 m wide.

At the end of each lane is a panel with 2 big buttons (random colors) and two images of different objects the child could choose.

On the panel team is allowed to tack anything it believes to be useful to complete the challenge.

The "ask"

After start, the judge will communicate which object the child (played by one student of the team) will have to ask to NAO.

The child can ask NAO the object the way the team prefers: touching one of NAO touch sensors, by showing an image of the object with a QR code, using a TAG or by vocal request.

The race

As soon as team believes NAO has "understood" the child request, will give the robot the ready to start command (ex. by touching one of NAO's head).

At this moment NAO's eys will become green, Softbank and Scuola di Robotica will provide each team an application which allows to synchronize NAOs so that the start for the race can be given by the judge.

When every NAO will be ready (inclusion means also to be respectful of different time needed by people), the judge will start the race

As soon as NAO will arrive to the panel and press the right button the arrival time will be registered.

Ranking:

* 1°: 30
* 2°: 20
* 3°: 10

Evaluation parameters

* Team spirit.
* Use of NAO – Software.
* Fun and originality.
* Ranking

1 TO 6 TEAMS WILL PLAY on the field at the same time.

Me & You game is about creativity, team spirit, video-making, capability of interacting exchanging ideas inside and outside NAO Community.

What can teams do? Use creatively digital instruments to offer everyone the possibility to be part of your team:

* Post videos and photos on social media (number of access will be evaluated)
* Publish news and communicate how your team is working, your projects, your difficulties and how you are going to find the solutions.
* Present team members and how your school and families are involved in your projects
* Be active Community's Forum, tickle other teams with amazing videos and get new ideas reading those of other teams from all over Europe!

To be sure contents you post are well scored they shall be announced on Community forum; name and descriptions must include this information: **"NAO Challenge 2019", Team NAME, Nation, School name.**

Social network:

YouTube :

* create your team channel, incorporate " NAO Challenge 2019 " in your video's names

Facebook, twitter, Instagram... :

* create your team pages/account, quote @naotherobot in your posts.

In all social networks use hashtag #NAOChallenge2019 in tweet, post, ...

THE TOURNAMENT

Tournaments are exciting events with head-to-head competition, judging interviews, and Teams and Robot performance awards.

Teams will prepare their robot to present to the juries test A and B.

Test C is a head to head challenge which will see up to 6 teams playing on the same field.

Test D will be evaluated the day before the tournament.

Ranking in the different tests will give the team scoring (1 for the best team, 2 for the second...).

The team which will get the lowest scoring after adding the scores obtained in the 4 tests will be the winner of the tournament.

Grants will be awarded to best Teams of each test rank.

JUDGING PROCESS

Juries will be made of teachers, institutional partners, engineers and robotic experts.

Jury session

* 5 minutes: setting
* 5 minutes: Teams presents to the jury and to the public.
* 5 minutes: Jury's question time
* 5 minutes: Judging

Each Team will have 10 minutes time (setting included) to present and show its demo to each jury.

Each test will start with team presentation to the Jury about scenery, adopted solutions and team work.

Will be particularly appreciated solutions which will demonstrate fun, simplicity, fantasy and creativity.

NAO's behaviour will be evaluated as it should be in real life situations and not only according to demo's results.

Each test will be evaluated separately. Awards will be announced at the end of the day in each tournament.

Judges will use evaluation grids* to help them determine which teams will receive awards.

Awards will be determined by a deliberation process, which is formulated around discussions of team performance in each category.

Final evaluation will be the result of deliberation process of all the juries together.

*On 30 of September evaluation grids will be available on the website.

RESOURCES FOR TEAMS

ON LINE SUPPORT

Teams will receive support from Scuola di Robotica's technicians which will organize webinar, both in Italian and in English, about NAO programming and to answer to doubts and questions about the Rules.

Immediately after registering, teams will receive links to technical webinar which were held last year.

New webinars will be held on November and December 2018, calendar will be published after the 3 of September, it will be registered and teams will be able to listen to it also at later date.

TESTING IN A REAL NAO

only for Italin teams.

Follow the updates to know how your team can take advantage of this opportunity.

TEACHERS' TRAINING

only for Italin teams.

Calendar will be announced in September.

TECHNICAL RESOURCES

Register your Team and/or register individually to SoftBank Developer Program . Through the menu, go to "Download" and select your robot version to have access to the software suite and to all the tools you will need to develop your applications for NAO.

Forum link:
https://developer.softbankrobotics.com/us-en/forum

English is the language to be used in Forum

For questions about rules, tournaments and any other problem, mail to: nao@scuoladirobotica.it

ROBOT AND SOFTWARE VERSIONS

All NAO's and software's versions can be used.

Software can be downloaded in your SoftBank Community account.

We strongly recommend to use the most recent version.

Team can choose to program NAO in the preferred language (using Choreographe, Python, C++).

Code used will have to be presented to Jury on the day of the tournament.

TECHNICAL REQUIREMENTS FOR THE DAY OF TOURNAMENT

Wi-Fi connections to NAO are allowed as well as non-embedded.

Teams will **have to provide its own router** to connect to the NAO and to provide laptops and any other **necessary tool** (cables, extension cords, batteries, ...)

The day of the tournament every test will be held in different and independent areas.

Starting and ending positions of the Robot (Start and end of the test) will be chosen by teams, it is only required a stable position for the Robot.

It's important to keep in mind that NAO's behaviours should be replicable and stable within any little difference between team's schools and jury's rooms.

Teams will have to give particular attention to ambient light variations and background noise in network connections, whose conditions rely on external unmanageable factors.

NB:

it's team's responsibility to make sure that NAO is ready for Demo to the Jury at the assigned time.

NAO

C:HALLENGE 2019

Scuola di Robotica

SoftBank Robotics