

National SkillsUSA Competition

NAO HRI Challenge



Competition Rules and Project

Specifications

What is the NAO HRI Challenge:

The NAO HRI Challenge is an activity organized in respect to the National SkillsUSA Competition events, with the support of SoftBank Robotics. The goal is to raise awareness, motivate and educate students in the use of humanoid robotics through multi-technological and innovative projects. Through programming, students create scenarios optimizing NAO's capabilities and taking into account its limitations, thus learning about applied user experience and interaction concepts.

Why Participate:

In the NAO HRI Challenge, students have the opportunity to program behaviors for the NAO robot during one day of hacking. Previous to the event day, the students will receive a half-day hands-on training session on robot functionality, architecture and development.

This competition is an educational activity aimed in particular at developing student initiatives and a taste for innovation, as well as scientific and technological skills. This challenge has been designed in collaboration with teachers, in order to complement in various scientific, technological and technical projects (for students aged 13 to 18).

Challenges:

The competition is divided into three challenges. Participation in each challenge is optional. Teams will be judged and prizes will be given to winning teams. The scoring sheet will be released prior to the final competition. Teams may be awarded partial credit for each attempted solution to the listed challenges.

Summary of Challenges:

1. PLAY WITH ME

Imagine an interactive game where NAO plays with a human. This is an open challenge.

2. NAO BOOGIE

Pick your top song, create a dance, and let NAO become a pop star.

3. ME & YOU

Teams are rewarded for their spirit, creativity, motivation, use of videos, images and social networks.

Details:

Challenge I: Game & Development: Play With Me

The goal is to imagine, design, and program an interactive game in which NAO plays against or with the student. This open challenge has just a few requirements, and it is meant to test both the programming and creative elements of the students.

Rules

- The game is **interactive**: NAO plays with a human.
- Rules for user-created game must be clearly established and presented to the jury before the attempt.
- Demo lasts no more than 2 minutes.
- Finding, buying, building or modifying any required accessory is under the team's responsibility, as well as bringing these accessories to the contest site.
- Starting and ending positions of the robot are left to the team's choice with one requirement only: keeping the robot in a stable position to avoid falling.

Concepts

- **Interactivity:** can include (but is not limited to):
- Dialog
 - Have NAO speak
 - Have NAO listen
- Animations
 - Use pre-packaged animations from the library
 - Design your own animations using the timeline editor
- Sensors
 - Have NAO react to touch sensors (head, hands, etc)
 - Have NAO react to internal memory values
- Logic
 - Have NAO make mathematical/logical deduction
- Vision Recognition
 - Have NAO recognize and react to a user's face, an object or a pictogram

Area of expertise

- Creativity, animation, programing, creation of accessories

Play With Me - Judging

Presentation of the Game <ul style="list-style-type: none">● How well were the rules explained? How did the game play out relative to how it was explained? NOTES:	85
Creativity / Fun <ul style="list-style-type: none">● How fun and compelling was the game? NOTES:	85
Dialog NOTES:	55
Animation NOTES:	25
Logic NOTES:	25
Sensors NOTES:	
Total	430

Challenge II: Animation & Choreography: NAO Boogie

NAO shows off a student created dance with the ability to recover gracefully in the event of a fall. In order to showcase not only a stable dance but also the ability to recover, the dance will have to be run twice- once undisturbed, and the second with an introduced fall over to demonstrate how it would recover.

Rules

- The demo should last a maximum of 1 minute
- The dance requirements:
 - All animations should be unique and utilize as many of NAO's degrees of freedom
 - Dance should play synchronized with music (played by NAO)
 - NAO should be in a stable position with smooth transitions (stays within center of mass)
- Teams should program a "fall recovery manager" with the following actions if NAO falls:
 - Stop the music
 - Stand back up
 - Resume the dance and music synchronously

Concepts

- Animations
 - Design your own animations using the timeline editor
- Balancing
 - Learn in relation to center of mass and support polygon concepts
- Fall Manager
 - Identify what triggers Fall Manager
 - Program NAO to fall gracefully and recover effectively

Area of expertise

- Creativity, animation, programming

NAO Boogie - Judging

<p>Animation</p> <ul style="list-style-type: none">● Have a creative and fun looking dance that utilizes as many of NAO's degrees of freedom as possible <p>NOTES:</p>	110
<p>Performance - Balance</p> <ul style="list-style-type: none">● Demonstrate NAO successfully completing the dance without falling. If NAO does fall, allow the team to let NAO recover and continue dancing again. After 2 falls, the dance should be considered done and judged. This category should be judged based on completeness of dance (i.e. if NAO performs 30 seconds total of the 1 minute dance, this should be a 55/110 for this section.) <p>NOTES:</p>	110
<p>Fall Manager Program</p> <ul style="list-style-type: none">● After the first go through has been seen if NAO has not fallen, restart the dance and institute a fall to check recovery. Does song pause? Does NAO stand back up? <p>NOTES:</p>	110
Total	330

Challenge III: Team and Project Presentation: Me & You

Introduce your team members and share your teamwork (problems faced and successes) to the other competing teams and the entire NAO user community! The video should be at least 5 minutes but not more than 7 minutes in duration. Times below 5 minutes or over 7 minutes will be assessed a time penalty of 20 points per 30 seconds or part thereof.

Rules

- Broadcast a video report detailing your team's efforts throughout the project
- Present the members of your teams, how your school, family and community are involved
- Use social media. Good mediums are the following, but not limited to:
 - Twitter
 - Facebook
 - Google+
 - Youtube

Me & You

Judging

<p>Video</p> <ul style="list-style-type: none">● How creatively and well done was the video? Over what span of time was covered? <p>NOTES:</p>	130
<p>Written Report</p> <ul style="list-style-type: none">● How detailed are the notes on the games? <p>NOTES:</p>	90
<p>Use of Social Medias</p> <ul style="list-style-type: none">● On how much social media did the team share on? <p>NOTES:</p>	120
Total	240