RoboCupJunior CoSpace Dance Rules 2014

RoboCupJunior CoSpace Technical Committee 2014:
Martin Bader (Germany), martin_bader@gmx.de
Lisette Castro (Mexico), ettesil77@hotmail.com
Josie Hughes (UK), jaeh2@cam.ac.uk
Jiayao Shen (Singapore), jyshen@sp.edu.sg
Baogang Wang (China), ziyunxinxi@126.com

RoboCupJunior CoSpace Technical Consultant:
Tianwu Yang (Singapore), yangtw@sp.edu.sg

This is the official rules for RoboCupJunior CoSpace Dance international event 2014. They are released by the RoboCup Junior CoSpace Technical Committee. These rules have priority over any translations. Differences between the RoboCupJunior CoSpace Dance 2013 rules and the RoboCupJunior CoSpace Dance 2014 rules are highlighted in red.

PREFACE

CoSpace Dance means one or more real robots, virtual robots, human come together to present a 1 to 2 minutes stage performance (theatre show or dance) in a creative designed real and virtual co-existence world.

The CoSpace Dance challenge is intended to be very open-ended. The CoSpace Technical Committee would like to encourage teams to be creative, innovative and use the full capacity of robotics technology and interactive digital media to create their performance. The CoSpace Dance Rules provides a framework on how to structure a CoSpace Dance/Theatre routine.

The CoSpace Dance Simulator can be found at http://www.cospacerobot.org. All communications can be realised using the CoSpace Dance simulator. All the rules are incorporated into the simulation environment.

1 GENERAL INFORMATION

1.1 Age Group
1.1.1 All team members must be the correct ages for the primary and secondary categories as state on the RCJ website http://rcj.robocup.org/about.html under “Ages”.

1.2 Authenticity and Originality
1.2.1 The performance must be unique and original. They should never been used in a RoboCupJunior CoSpace Dance competition in any previous year’s round of regional or international competition.

1.2.2 Teams who, in the opinion of the judges, have knowingly produced duplicate robots, costume or performance movement (duplicate music is allowed) of another team or reused previous year's robots and performance of the same team will be subject to penalties. Penalties range from score reduction to a maximum penalty of exclusion from the competition. Teams are encouraged to fully check that all robots, props and costumes conform to these rules.

1.2.3 Teams are encouraged to bring a learning journey or any form of documentation describing their preparation efforts including photographs of the different stages of robot development or virtual environment design. The documentation must be presented during the interview, and may be called upon to help establish the authenticity of a team’s performance.
1.3 Content

1.3.1 Any performance that includes violent, military, threatening or criminal elements will be excluded. Any team using an inappropriate name or logo will also be excluded. Participants are asked to carefully consider the wording and messages communicated in their presentations. What seems acceptable to one group may be offensive to friends from a different country or culture.

1.4 Security and Safety

1.4.1 In order to protect participants, RoboCup officials and bystanders, routines may not include real explosions, smoke or flame, use of water, or any other hazardous substances. (All extraordinary effects can be added in the virtual environment if teams wish to do so).

1.4.2 Each team whose routine includes any situation that could be deemed hazardous, including the possibility of damaging the stage, must submit a report outlining the content of their performance routine to the Chief Judge BEFORE the competition. The Chief Judge may also request a demonstration of the activity arriving at the stage performance. Teams not conforming to this rule may not be allowed to present their routine.

1.4.3 In no circumstances is mains electricity allowed to be used on stage. This includes the use of mains electricity for robots, scenery and props.

1.5 Competition

1.5.1 In CoSpace Dance/Theatre performance, the main emphasis of this performance is on

- Real robot design and construction (sensors, actuators, and programming)
- Virtual robot design (appearance and programming)
- Virtual environment set-up (creative 3D design)
- Cinematography (Creative use of virtual cameraman)
- Communication (real-virtual communication and virtual-virtual communication)

1.5.2 The RoboCupJunior CoSpace Dance Technical Committee would like to encourage teams to be creative, innovative and inspire the audience.

1.5.3 All teams are judged with 3 kinds of methods. These are the technical interview, the original dance performance and the SuperTeam performance.

- **Technical Interview** is an interview examination in which all robots and programming are judged with technical aspect. Creative and innovative works are rewarded with higher scores. Also judges see students’ understanding of robotic technologies and virtual robot/environment design. Teams must show authenticity and originality of their robots and performance in this interview.

- **Original Dance Performance** is an individual team's stage performance in which a performance routine is judged from creative, innovative and entertainment aspect. Teams must show originality, creativity and innovation through their performance routine. It is important for teams to execute and demonstrate what they planned. It is expected that all participating teams perform their performance at their best.

- **SuperTeam Performance** is a spontaneous robotic dance performance by cooperating with the several teams. In a short period collaboration at the competition venue, teams must create a new performance with new teammates as a SuperTeam. Teams are encouraged to create an exciting and entertaining performance which cheers up the competition, like the Super Bowl Halftime Show. It is hoped that all participating teams will show the fruits of their collaboration.

1.6 Poster Display
1.6.1 Teams will be given some public space to display a poster board. The size of the poster should be no larger than A1 (60 x 84 cm). The poster should be brought along to the technical interview. After the interview the poster should be displayed in the location indicated.

1.6.2 The aim of the poster is to explain the technology used in the robots. Posters should be made in an interesting and entertaining format, as they will be viewed not only by the judges, but also by other teams and the visiting members of the public. The poster should provide information about the team and how you developed the robot(s). Areas that need to be covered include: team name, division (primary or secondary), a picture of your team, your country and your location in your country, a little about the area you live in, pictures of the robot(s) under development, and information about your robot technology. Include any interesting or unusual feature about the team, robot, your background or your entry.

1.7 Download

1.7.1 CoSpace Dance interview score sheet, performance score sheet and Technical sheet can be downloaded from the official RoboCupJunior website (http://robocupjunior.org). Teams are encouraged to use the score sheets when preparing their CoSpace Dance performance.

2 STAGE

2.1 Size

2.1.1 The size of the performance stage area will be marked in a rectangular area of 6 x 4 meters for real robots with the 6m side facing the judges. If the whole body of a real robot (main body of robot not including any large extensions from the body) moves outside the marked boundary of the performance area the team will receive a penalty score. If in doubt please consult with the Chief Judge for clarification of “robot body” in relation to your robot design.

2.1.2 Human performers may be inside and outside the marked area.

2.1.3 The boundary of the performance stage area will be marked with a 50 mm black tape line, surrounded by a 20mm red tape line. This can also allow teams to use the black and red line tape boundary to program a real robot to identify the performance stage area.

2.2 Surface

2.2.1 The stage floor provided shall be made of flat (non-glossy) white painted MDF (compressed wood fibre).

2.2.2 While floor joints will be taped to make them as smooth as possible, real robots must be prepared for irregularities of up to 3 mm in the floor surface.

2.2.3 Whilst every effort will be made to make the stage flat this may not be possible in all venues. Teams should be prepared for some irregularities in the surface of the stage.

2.2.4 Teams are encouraged to practice on the same flooring type to have a better simulation for robot conditions and reduce the set-up time at the RoboCupJunior Competition.

2.3 Lighting

2.3.1 The RoboCup organizers will endeavor to make variable lighting including spotlights available. Teams should not expect the performance stage area to necessarily be able to be darkened. We cannot guarantee direct or intense spotlights to be available. It is recommended that teams design their real robots to cope with variations in lighting conditions, as lighting naturally varies from venue to venue. Teams should come prepared to calibrate their real robots based on the lighting conditions at the venue.

2.4 Performance Stage Utilization

2.4.1 The main performance stage will be made available for teams to practice on. In fairness to all teams who may wish to practice, a booking sheet will be used to reserve the stage for a short practice time.
2.4.2 The last team to practice on the main stage before performance time starts must fully clean up the stage and clear the stage area at least 3 minutes before the performance start time.

3 ROBOTS AND COMMUNICATION

3.1 Real Robots and Virtual Robots

3.1.1 There will be two types of robots – real robots and virtual robots. Teams are encouraged to use sensor technology and communication innovatively while making real robots. Teams are also encouraged to design and program virtual wheeled robots and humanoid robots creatively. Unusual, innovative or inspired ways to create an engaging performance is encouraged with reward. If you are unsure whether the technology you are using is appropriate please contact the Chief Judge before the competition.

3.2 Number of Robots

3.2.1 There may be any number of real robots and virtual robots on a team. Using multiple robots does not necessary result in obtaining higher points. The creative design and real/virtual robot communication/interaction is one of the judging criteria.

3.3 Size

3.3.1 Real Robots: Real Robots may be of any size. Any props should not distract the audience view of the backdrop for the virtual robots and environment projection. Any real robot(s) taller than 4 meters from the stage floor must be discussed with the judges and permission sought.

3.3.2 Virtual Robots: Virtual Robots may be of any size and any design. For example, the virtual robot(s) can be designed as a car, a moving-tree, a Barbie, a spider-man, etc. The virtual robots should move and act in the virtual environment.

3.4 Control

3.4.1 Both real and virtual robots must be controlled autonomously. Except the communication specified in section 3.6.1, no other form of wired/wireless communication is allowed. No member of the team may make physical contact with the real robot during its performance UNLESS it has been discussed and approved by the judges PRIOR to the performance.

3.4.2 Real robots may be started manually by human contact or with a remote control at the beginning of the performance. Virtual robots may start automatically according to the sequence of the performance. (Refer to 4.4)

3.5 Costumes

3.5.1 Costumes for real robots and human performers are encouraged, and points will be awarded.

3.6 Communication

3.6.1 Communication between real robots and virtual robots

During the performance, any real robot may communicate with any virtual robot. The communication mode is ZigBee. The communication can be initialised by either real robots or virtual robots.

3.6.2 Interaction and Communication between virtual robots

During the performance, virtual robots can communicate with each other via programming.

3.6.3 It is the teams’ responsibility to make sure that their communication does not interfere with other teams’ robots when practicing or performing. No team is permitted to use radio frequency (RF) signals like WLAN wireless communication, as this may interfere with robots
in other leagues. Teams with robot communication MUST explain the device as well as the program to the judges at the interview.

4 ORIGINAL PERFORMANCE

4.1 Kind of Performance

4.1.1 RoboCupJunior CoSpace Dance allows teams to create a 1 to 2 minutes creative stage performance using autonomous real robots, virtual robots and 3D virtual environment that teams have designed, built and programmed. Teams can choose to have a theatre (drama) or dance performance. Both must be delivered in real/virtual co-existence world (with real/virtual environment communication established).

4.1.2 In CoSpace Dance, teams are required to build real robots, design virtual environment including virtual robots and establish communications between the real and virtual objects wirelessly using Bluetooth or Zigbee. Virtual robots and items in the virtual environment should react accordingly once they receive a signal from real robots. The real robot or items in the real environment should react accordingly once they receive a signal from virtual environment. The effective interaction between real and virtual worlds is one of the judging criteria.

4.2 Duration

4.2.1 Each team will be given a maximum of 6 minutes on stage. It includes:

- 5 minutes for their performance. This time includes stage set-up, stage presentation, performance routine, and any re-starts due to factors under the teams’ control.
- 1 minute for team to remove any objects related to their performance and fully tidy up the stage.

4.2.2 The duration of a performance routine must be more than 1 minute and less than 2 minutes.

4.2.3 If a team exceeds the time limits as explained in 4.2.1 and 4.2.2 with their own fault, the team will be penalized by the loss of marks. A judge starts a stopwatch when a team member steps a foot on the stage for the maximum 5 period and following 1 minute to clear the stage. If the time limit is exceeded due to circumstances outside the team’s control (for example problems with projector) there will be no time penalty. The judges will have the final decision on any time penalties.

4.3 Music and Video

4.3.1 Music and video must be embedded in the virtual environment if teams choose to have. You may have more than one piece of them for the entire routine to enhance the theme delivery.

4.3.2 Teams are strongly encouraged to use a good quality audio and video source.

4.4 Human Team Members

4.4.1 Human team members are encouraged to perform with their robots. There is no penalty for humans not performing with their robots. However, it may affect the entertainment marks.

4.4.2 The only physical contact humans can have with their real robots are:
- to start the real robot(s) at the beginning of a performance.
- the physical contact is a part of the performance (This has to be discussed with and approved by the judges PRIOR to the performance).

4.5 Scenery

4.5.1 Real scenery:

Teams are encouraged to provide their own scenery on stage.

4.5.2 Virtual scenery (3D virtual environment)
Teams are required to design virtual scenery. The virtual scenery may include virtual 3D objects (buildings, trees, etc.), virtual video display, music, speeches, or animations, etc. that suit the theme of the performance. The virtual environment will be projected on the backdrop screen as an extension of the real world. Organizers will provide a projector and projection screen for teams to incorporate the virtual environment as well as virtual robots as part of the CoSpace Dance performance. Team can use any form of Digital Interactive Media to create objects and embed them into the virtual environment to enhance the theme.

4.5.3 Teams need to build the 3D virtual environment on their own PC/laptop. They need to connect their own PC/laptop to the AV console and play the virtual scenery during the competition. **It is strongly recommended for teams to try the connection PRIOR to the actual performance.**

4.6 Performance Routine

4.6.1 Each team may perform one and only one Dance or Theatre performance routine. The same performance routine will be repeated if they proceed to the finals. Some minor modifications (improvements) of the performance using the same story/music may be accepted. Any questions or concerns on performances and/or robot modifications at the venue should be discussed with the Chief Judge.

4.6.2 One of the team members needs to start-up and control the 3D virtual environment for the routine.

4.6.3 One human team member or several members, for a team with multiple real robots and props, can start each real robot, either by hand or remote control.

4.6.4 The performance routine begins when human/real robots starts performing or virtual environment presentation begins.

4.7 Restarts and Retakes

4.7.1 Teams are allowed to restart their routine if necessary, at the discretion of the officials. Unless a problem is not the fault of the team, any restart will result in a score penalty. There is no limit on the number of restarts a team can perform within their 5 minutes performance time. Team will be asked to leave the stage after 5 minutes.

4.7.2 Teams need to discuss with the officials if they face serious technical issues which is outside of teams’ control.

4.8 Stage Setup Time

4.8.1 Teams are strongly encouraged to use the time whilst they are setting up the stage for their performance to do stage presentation of introducing to the audience the features of their robots, technology used and highlights of the robotic performance and to introduce their team.

5 JUDGING CATEGORY AND SCORING (ORIGINAL PERFORMANCE)

Technical interviews, stage presentation and stage performances will be judged using the published score sheets. Teams are encouraged to study the score sheets in detail in order to understand how they will be judged.

5.1 Technical Interviews

5.1.1 All teams will have a 20 minute technical interview before their performance.

5.1.2 Teams should bring all their robots, props, virtual environment, copies of the programs, technical sheet and necessary documentation, such as learning journal, to their technical interview. They should be prepared to demonstrate the sensors, electronics, real/virtual communication and technology that they have used. Please refer to interview score sheet for detail assessment.

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5.1.3 A Technical Sheet should be carefully completed by teams and presented to the CoSpace organizing committee during interview. The technical sheet is used to give teams the opportunity to explain the technical aspects of their robots to judges. Teams are advised to study the Dance score sheet before they complete the technical sheet.

5.1.4 Interviews will take place in English, if teams require a translator they should inform the local organizing committee by e-mail prior to the event to allow translators to be organized.

5.1.5 Teams may be asked to have second interview if judges consider it is necessary. If this occurs the score from the second interview will be used to calculate the overall scores.

5.2 Stage Presentation

5.2.1 Teams are required to give a presentation at beginning to tell audience their performance, e.g. What the story or dance performance is about; how does the team design both real and virtual world; how does real/virtual worlds interact. Teams are encouraged to have the stage presentation during the team setup (Section 4.8)

5.3 Stage Performance

Stage performances will be judged according to the following categories:

5.3.1 Real world (main stage) setup including real robots, robot costumes, stage props, creative use of sensors and stage arrangement.

5.3.2 The real robots should have solid construction, components should not fall off, and Robots movement should be smooth and controlled. Sensors should be used effectively (e.g. to trigger different parts of the program, for detection of boundary line, etc). The motorized props, static display, back drops, lighting effect, or any special effect should enhance the performance. Costumes should be appropriate, innovative, well made and complement the performance.

5.3.3 Virtual world setup including virtual robots and 3D environment design

Virtual robots design should be fit into the theme well. 3D Virtual environment including various Interactive Digital Media activities enhances the overall performance.

5.3.4 Virtual/Real world communication

2 types of communication will be assessed.

• Communication between virtual robots and virtual objects.

• Communications between real robots and virtual robots/objects.

5.3.5 Choreography and Cinematography

Creative use of the virtual camera and creative theatre/dance performance presented.

5.3.6 Entertainment value

Human, real robots, virtual robots, and virtual environment contributed to communicate the theme and enrich the performance. The overall performance should be entertaining, exciting, and enjoyable and will successful convey the story or theme.

5.4 Scoring

5.4.1 The overall score of each team is calculated as follows:

• Technical interview – 45%

• Stage performance – 55%

5.4.2 In the first round, all teams will be given 2 opportunities to perform. The highest performance score will be added to the technical interview score to calculate an overall score.

5.4.3 The top scoring teams from the first round will then be announced and asked to perform again in the final round. The performance scores for the teams in the final are “zeroed” at this point. The performance scores from the final round and the interview scores will be used to calculate the overall score for the teams in the final.
6 SUPERTEAM PERFORMANCE

6.1 Prelude

6.1.1 The CoSpace Dance Team will work together with Dance Teams to form a Dance SuperTeam. It is a RoboCupJunior International opportunity to produce a spontaneous robotic dance performance by cooperating with the several teams. A SuperTeam consists of two to four teams from different countries chosen by the Dance Technical/Organizing Committee.

6.1.2 There will be no dance and theatre categories in the SuperTeam challenge. All SuperTeams are encouraged to create a performance which makes audiences entertain and livens up the soccer game.

6.1.3 All teams involved should contribute to the creation of the new SuperTeam performance.

6.1.4 It is expected that the development of the super team performance will take place at the competition venue. The judges will be circulating around the teams to assess teamwork during the development of the new super team dance.

6.1.5 All SuperTeam are encouraged to have a technical introduction session at the first SuperTeam meeting. Learning about new teammates and other team's robots is instructive for making new SuperTeam performance.

6.2 Stage size

6.2.1 Each SuperTeam can use the whole stage area.

6.3 Robots and props

6.3.1 It is assumed that the SuperTeam will use existing robots. Teams are not required to build new robots, however, modifications to existing robots and re-programming are encouraged and rewarded. “Hand made” modifications to both robots and props are rewarded more highly than commercially purchased changes.

6.4 Duration

6.4.1 Each SuperTeam has 7 minutes on stage with a performance more than 1 minute and less than 2 minutes.

6.4.2 Each SuperTeam must fully clean up the stage, remove any objects related to their performance, and clear the stage area no more than 1 minute after the end of their performance.

6.5 3D Virtual Environment

6.5.1 Each SuperTeam can use the same 3D virtual environment as for the original performance. It is strongly recommended that teams can modify and present a new design that suits the SuperTeam performance.

6.6 Presentation

6.6.1 Each SuperTeam performance must start with a presentation that introduces the teams, their countries and also describes how the teams cooperated to create the new dance. The presentation should describe the theme chosen, any difficulties they had to overcome and include what they have learnt about other teams and their robots. This presentation should be included in the 7 minutes period. The presentation can be a recorded presentation such as a video or slide show.

6.7 Choreography

6.7.1 Each SuperTeam is to produce a co-coordinated choreography of their robots. This may include human performers if the teams decide to perform with robots.

6.8 Observers
6.8.1 Every SuperTeam will be assigned a judge or a translator as an observer. Observers can assist
students' communication but cannot be involved in creating the SuperTeam performance.

6.8.2 Each observer is encouraged to join in the technical introduction session of the SuperTeam
assigned, though there is no need to be active throughout the SuperTeam activity.

6.8.3 Observers can ask extra translators to assist communications between the SuperTeam
members. Assigning a translator to a belonging team's mentor is not prohibited. In that case,
what they can only do is to ASSIST the SuperTeam in translation. Mentors MAY NOT do the
actual hands-on work including construction, programming, choreography and/or take over
the SuperTeam collaboration among students.

7 PRIZE AND AWARD
The awards are determined by combining the interview and their best final performance
score. Depending on the number of teams entering the competition, there will be awards for
trophies and certificates.

7.1 Trophy
7.1.1 Four prizes will be awarded:
• RoboCupJunior CoSpace Dance Champion is awarded to the team that achieves the
highest overall total score (Interview - 45% and Performance - 55%).
• RoboCupJunior Dance SuperTeam Prize is awarded to a SuperTeam which gained the
highest SuperTeam performance score.
• RoboCupJunior CoSpace Dance Best Virtual and Real Communication is awarded to the
team who established virtual/real communication and be able to use the communication
effectively and creatively.
• RoboCupJunior CoSpace Dance Best Virtual Space Design is awarded to the team who
designed the best virtual robots and virtual environment.

7.2 Certificate
7.2.1 Certificate Award will also be given to individual teams in the following categories:
• Best Choreography and Cinematography
• Best Entertainment Value
• Novice Team
• Best Stage Presentation Award

8 CODE OF CONDUCT
8.1 Spirit
8.1.1 It is expected that all participants, students and mentors, will respect the RoboCupJunior
mission. In addition, participants should keep in mind the values and goals of RoboCupJunior.

8.1.2 It is not whether you win or lose, but how much you learn that counts. You will really miss
out on a lifelong learning experience if you don't take this opportunity to collaborate with
students and mentors from all over the world. Remember this is a unique moment!

8.2 Fair Play
8.2.1 It is expected that the aim of all teams is to participate in a fair and clean competition.

8.2.2 Humans that may cause deliberate interference with robots or damage to the stage will be
disqualified, if part of a team. If not part of a team they will be asked to leave the venue.
8.2.3 The team is responsible for removing all debris left from their routine that may interfere with the performance of subsequent activities.

8.2.4 Remember: Helping those in need and demonstrating friendship and cooperation are the spirit of RoboCupJunior as well as for making a better world.

8.3 Sharing

8.3.1 It is understood that RoboCupJunior International events with rich technological and curricular developments should be shared with other participants after the competition.

8.3.2 Any developments may be published on the RoboCupJunior Web site following the event.

8.3.3 Sharing information furthers the mission of RoboCupJunior as an educational initiative.

8.4 Collegiality

8.4.1 In keeping with the spirit and collegiality aspects of RoboCup International, a party will be provided by the organizers for all team members, mentors and supporters. It is strongly requested that all such individuals delay their departure sufficiently to attend, even if the party is held after the finals and presentations. The organizers request all team members bring business-sized cards to share with other teams at the party. These cards could include the team name, its members' name(s) and contact details, so students can remain in contact with each other after the event. This is optional, but encouraged. It is also requested, but not compulsory, for team members to wear either national dress, or some icon that identifies them with their country. This can be done in a humorous manner, such as an animal mascot from their country or another creative idea.

8.5 Behaviour

8.5.1 All movement and behaviour is to be of a subdued nature within the event venue.

8.5.2 Competitors are not to enter set-up areas of other leagues or other teams, unless expressly invited to do so by other team members.

8.5.3 Participants who misbehave may be asked to leave the building and risk being disqualified from the event.

8.6 Mentors

8.6.1 Mentors (teachers, parents, chaperones and other adult team-members) are not allowed in the student work area, except to assist carrying equipment in or out of the area as teams arrival or departure days.

8.6.2 If a problem is encountered with a computer or other device that is clearly beyond the reasonable ability level of a student to repair, a mentor may request permission from the organizers to enter the work area for the sole purpose of attending to that repair. They must leave the work area immediately after this is completed. Rule 6.6.1 still applies at these times.

8.6.3 Mentors are not allowed to set up such equipment on stage, as this should be the responsibility of team members. Organizers will assign volunteers to teams that need an assistant for stage set-up. Teams should request this assistance to the officials.

8.6.4 A mentor found in the student work area without an acceptable reason may lose his/her access to the venue and the team marks will be penalised. This applies to both the “individual” and “SuperTeam” competition.

8.6.5 A mentor found to be involved with mending, building or programming the robot(s) may lose his/her access to the venue and the team marks will be penalised.

8.7 RoboCup Officials

8.7.1 The referees and officials will act within the spirit of the event.

8.7.2 Interviews will be judged by at least two RoboCup officials. Stage Performances will be judged by a panel of at least three officials. One of the performance judges is the RoboCup official who judges the interview as well.
8.7.3 The officials shall not have close relationship with any of the teams participating in the CoSpace Dance performance.

8.8 Information about the event

8.8.1 Teams will be responsible for checking the updated information during the event. The updated information will be provided on notice boards in the venue, and possibly on the RoboCup website. The information will be announced at the beginning of the event and will be posted on the notice boards as well.

8.8.2 Queries regarding these rules or their interpretation may be sent to the CoSpace Technical Committee, Shen Jiayao (Singapore), at jyshen@sp.edu.sg.