



Humanoid League Proposed Roadmap

The RoboCup Soccer Humanoid League roadmap has been constituted in the year 2014 to lay out a rough plan of milestones that the Humanoid League would have to reach on the way to the 2050 goal: to defeat the human world champion soccer team in a fair game according to the FIFA rules. The idea of the roadmap is to define large changes to the environment and the gameplay, which take effect every five years to encourage a steady long term development of the league. For each five year min robot height, field length, max number of players in each team and also duration of play per half have been proposed. The currently three size classes will successively be reduced to two and finally one as the minimum robot heights will be increased over the years. The planned technical challenges for this duration have come at the end.

- RoboCup Humanoid League Mailing List (to be used for roadmap discussion and questions): <https://lists.cc.gatech.edu/mailman/listinfo/robocup-humanoid>
- RoboCup Humanoid League Home Page: <http://www.tzi.de/humanoid/>
- RoboCup Humanoid League Wiki: http://wiki.robocup.org/wiki/Humanoid_League

****2014****

Last year of "incremental" changes in a color coded environment.

- Min robot height: 40 cm
- Field length: 9 m
- Max number of players: 4
- Duration per half: 10 min

Technical Challenges:

1. Walking on astro turf
 2. Push Recovery
 3. Throw-in
 4. Dribbling with an unknown ball
 5. High Kick
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****2015****

Robots are playing in a miniature FIFA soccer field environment. Color coding has been mostly abandoned. We use white goals and a FIFA compliant ball of size 5, which we can characterize as "at least 50% white". The floor is covered with astro turf of some green shade to simulate a grass like texture. Field markings are a scaled version of a FIFA soccer field.

- Min robot height: 40 cm
- Field length: 10 m
- Max number of players: 4
- Duration per half: 10 min

Technical Challenges:

1. Coordinated pass and strike (the ball must not stop)
 2. Coordinated throw and strike (the ball must not stop)
 3. Push recovery
 4. Top speed
 5. High Kick
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****2020****

We double the field size and the match duration. Game play is fully autonomous. Throw-ins, penalties, substitutions etc. are performed without human intervention. There is only one class for all sizes.

- Min robot height: 60 cm
- Field length: 20 m
- Max number of players: 6
- Duration per half: 20 min

Technical Challenges:

1. Running
 2. Kick from running
 3. Push recovery
 4. Top speed
 5. High Kick (abandoned when robots kick higher than the goal)
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****2025****

Increase in field size, number of players and game duration.

- Min robot height: 80 cm
- Field length: 30 m
- Max number of players: 6
- Duration per half: 25 min

Technical Challenges:

1. Jumping
 2. Heading
 3. Push recovery
 4. Top speed
 5. Long distance kick (who can score a goal from the largest distance)
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****2030****

It's time to play against humans. The robots should play competitive games against an unprofessional human team, for example the TC.

- Min robot height: 100 cm
- Field length: 50 m
- Max number of players: 8
- Duration per half: 30 min

Technical Challenges:

1. Scoring against a human goalie
 2. Defending against a human striker
 3. Outrunning the president of RoboCup
 4. Push recovery
 5. Top speed
 6. Long distance kick
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****2035****



Field and game duration increase. Play games against junior champion teams.

- Min robot height: 120 cm
- Field length: 70 m
- Max number of players: 8
- Duration per half: 35 min

Technical Challenges:

1. Scoring against a human goalie
 2. Defending against a human striker
 3. Outrunning the president of RoboCup
 4. Push recovery
 5. Top speed
 6. Long distance kick
 7. Robot Shower (prepare for rain and dirt)
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****2040****

Full FIFA compliance. A soccer field of at least 90 m in length, 11 roughly human sized players on the field, outdoors on grass, 45 minutes per half, all free-kick, throw-in and offside rules applied, limited number of substitutions and full autonomy. All games are played against a human team.

- Min robot height: 140 cm
- Field length: 90 - 120 m
- Max number of players: 11
- Duration per half: 45 min

Technical Challenges:

1. Scoring against a human star player goalie
 2. Defending against a human star player striker
 3. Outrunning an olympic champion
 4. Long distance kick precision
 8. Air Kick
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