

RoboCup Qualification Video

Analyzing streams of images is our strength ... creating them not so much.

After some struggle and sleepless nights we proudly present our qualification video for the RoboCup 2017:

RoboCup 2017 Qualification Video - FManoids



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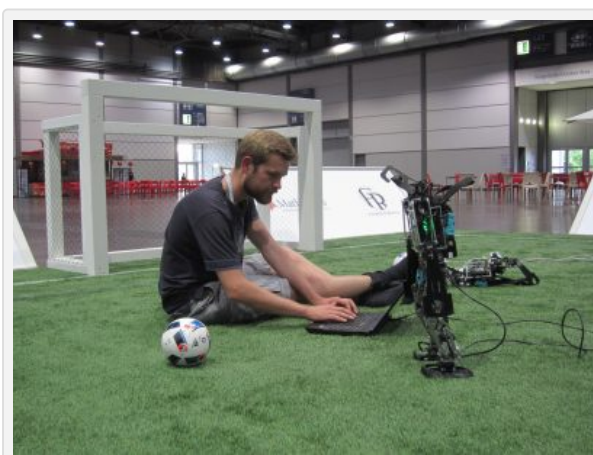
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January 16th, 2017 | Category: [Uncategorized](#) | Comments are closed

It's time again – We are at RoboCup 2016

This year, **RoboCup** takes place in Leipzig – basically just round the corner. And after intensive work in the past few months we are using the setup days to really get our robots going. Not only have we come with new software, but we want to put our new robot platform to the test.



At the moment our robots are acclimating to the light and ground conditions. Unfortunately some of the few robot parts we had to order (vs manufacturing them ourselves) did not arrive in time, so that we have to live with using a temporary setup. And there's quite a few things left to do until the first games on Thursday.

The construction of our new robots was supported by the **Karl Dieringer** company from Berlin Lankwitz. They are specialized working with sheet metal and supported us manufacturing the aluminum parts of our new robots.

Already the **first prototype** was built with their help. Regular discussions about feasibility of designs allowed us to fix the problem in the prototype. In addition to adjusting the lower leg design, allowing us a larger moving space, and other minor improvements, the major change was a complete overhaul of the torso. It is now significantly slimmer and higher, giving us sufficient space for our **power supply**, **Erolf**, a 5-Port Gigabit switch, battery and two Odroid XU4 boards.

The new robots stand tall at 76cm – that's almost 20% larger than last year's model.



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Report RoboCup IranOpen 2016

Now that all robots and robot builders have returned to the lab safely, a short report about the IranOpen seems like a good idea.

The preparation days went along rather smoothly. At first we had planned to take along our new robot model but due to undelivered parts we had to leave our newest team member in Berlin. Since Ada, John and the others are already seasoned football players no bigger problems surfaced during the preparations. Six teams in total came to Teheran, split into two groups. The Iranian teams Parand, AEHuman and MRL were in the first group, the Bold Hearts from England, the Hamburg BitBots and us made up the second one.



During the first match against the Bold Hearts our robots showed what they are capable of and played one of the most successful games of our team history. 5:0 was written on the leaderboard after 20 minutes. Emmy and Ada scored three solid goals.

Even John, normally our goalie, was able to hit the goal twice after we let him play on the offense. The start of the group phase seemed to go well.

The next game against the BitBots did not go as well. Due to Wifi problems no robot on the pitch received any signals from the game controller software. For their first 13 minutes there basically was no game. Even though we are able to let one robot play without game controller commands, Emmy was not able to dribble around four BitBots on her own. During the remaining time the ball got close to the goal line but just did not want to go over it. The game ended 0:0 and as group leader we moved on to the semi-final.

Based on the results of the group stage and the intermediary rounds we faced the Bold Hearts again in the semi-final. Only two of their team members had travelled to Iran but the team is known for pushing their performance with over-night coding sessions. Just like this time. The Darwin robots played better than in the first match. On the contrary our robots had a lot of bad luck. A previously undetected software bug froze the software every time one of the players finished standing up. A robot who had fallen down had to be taken off the pitch and received a time penalty. Additionally Ada damaged one of her gearsets in her arm. This together with a damaged cable led to a power overload and blew the fuse. Although we could exchange a fuse in only 14 seconds, Ada was not able to continue playing. Finally John stubbornly refused to properly detect the goals and thus did not contribute much to the game. At the end of the overtime the ball had been in the British penalty box seven times but the score had remained 0:0. The penalty shootout was won by the Bold Hearts 2:1. The game was very exciting and as usual with the Bold Hearts, very fair. Now only the match for the third place was left.

The evening saw us giving a lot of attention to our robots. Especially Ada and Emmy were serviced intensively. On the last day of the competition we played against the BitBots again who again placed four robots on the football field, including their new model HULK. It seemed as if our players had accepted the received attention benevolently and again showed a good performance. Ada and Emmy in particular played a strong match and dribbled the ball through the tight defense of the Bitbots several times. With a final score of 2:0 we secured the third place.

In addition to the games teams were offered a technical challenge. In the past these included tasks like a proper throw-in or jumping. Since there exists a league for mine clearance at the Iran Open we were able to test our walking on rough ground. The testing area was filled with sand, rough gravel as well as various obstacles like barbed wire, branches, rocks and mine. While Emmy was able to walk on sand just fine the gravel proved to be quite a challenge. Her feet are so small that she sometimes sunk in between the small rocks. She actually was able to walk on the surface, just not very fast.



All in all the team can be happy with its performance. The new team members Tanja and Arne gathered their first tourname experience and Ju, borrowed from the BitBots, was able to contribute to the teams performance very well. Nine goals were scored during normal playing time in the entire league, seven by us. Additionally we mastered the technical challenge. Now we can focus on our new robot model and the preparations for the RoboCup in Leipzig.

Apart of the tournament we enjoyed the hospitality of the Iranian people and could get a view of the society and culture. All in all it was a very interesting trip!



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April 22nd, 2016 | Category: [Uncategorized](#) | Comments are closed

Puppet mastery for adults

In the past the Fumanoids were able to gain a special reputation. Optimizing hard- and software each season by only making little changes? Rubbish! We rather send a new series of robots into the fray and rewrite our entire software, not without considerable pressure of time. This year will be no exception.

A new generation of robots will see the light of day and will have to learn to walk. Of course the whole software framework and the motion control will be redone as well. The movements of the robot are no controlled by inverse kinematics which opens up many new possibilities for the coders. One of them can be seen in this video:

Hand Control



The mobile phone is connected to the robot via wifi and synchronizes with its left hand. The gyroscope of the phone registers changes in orientation and transmits them to the robot who in turn tries to copy the movement of the phone with his left hand. He only receives only the desired position. How to move all his joints is calculated by him on his own. This procedure can be applied to any extremity of our little tin man.

We should be able to control the robot like a puppeteer with multiple phones. IF several humans are able to coordinate their actions. It seems there will be various possible applications of this in the area of team building....



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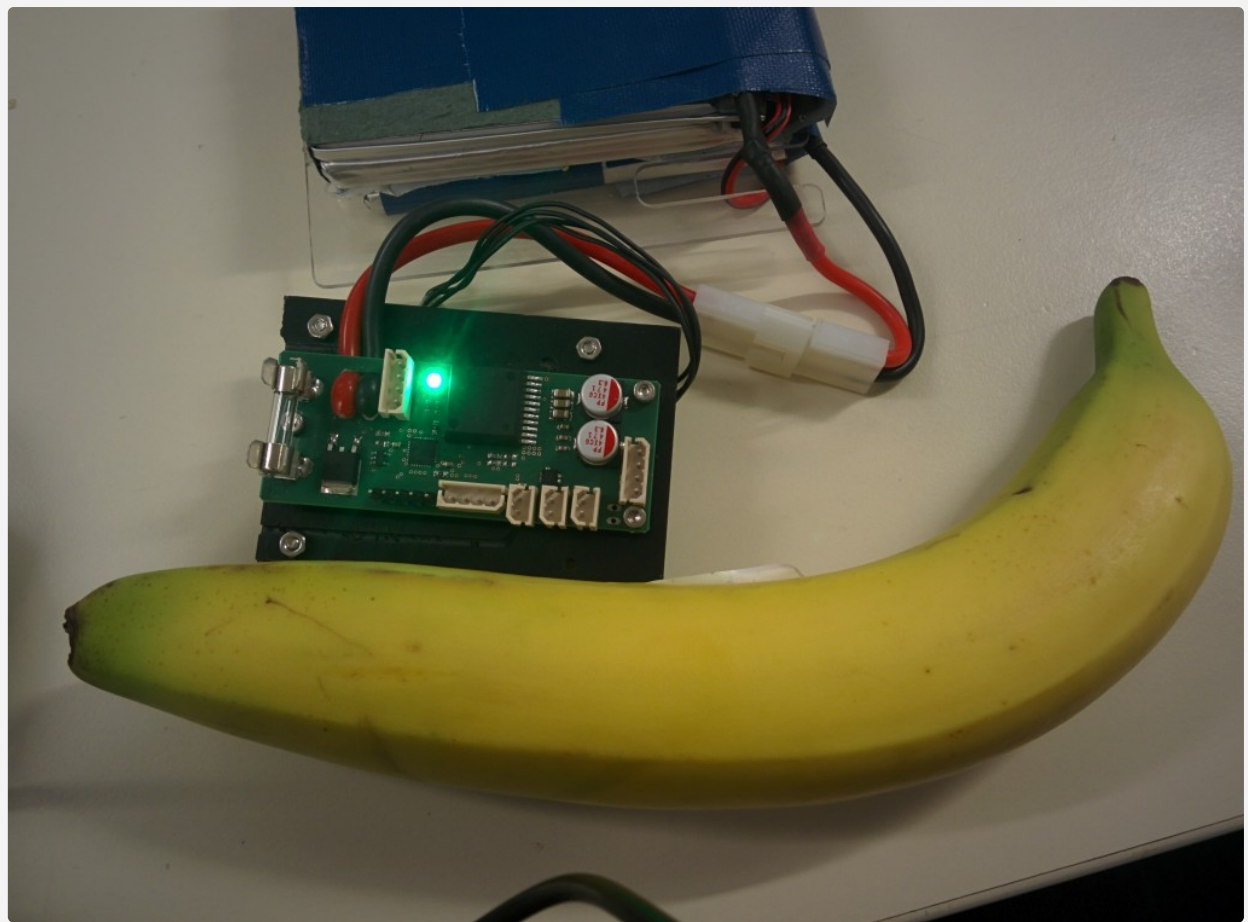
March 10th, 2016 | Category: [Uncategorized](#) | **Comments are closed**

New Power Board (yes, again!)

The FUmanoids did it again again!

Years after the scheduled and years before the actual opening of Berlins new airport the FUmanoids finished another piece of hardware.

The new power supply board works just nice! Assembly and programming everything went pretty quick this time. In less than one week everything got worked out and in the end we got some neat new power supply boards that generate WAY more juice for 5V applications.



The new PowerSupply board (Banana for scale)

As you can see some things changed on the board:

- We replaced the huge DC/DC-Converter with a smaller but far more powerfull (10A vs 1A!) different component.
- We replaced that AVR Processor with a Cortex-M0 which introduces the advantages:
 - in circuit programming
 - Way more processing power yet about the same current consumption
 - smaller footprint
 - 12Bit ADCs (2 bits more than that AVR)
 - DMAs to reduce the processor load during data acquisition
 - A lot more of neat features!
- We can now monitor the current consumption on the 5V Domain and on the Servos. We can even monitor the revers current induced by BEMF

The PCB was manufactured by LeitON who covered the costs for the boards. Many thanks to the support from that company!

You can find the schematics, designs and the code here: <http://www.fumanoids.de/hardware/powerboard/>

Currently we are working on a lot of other cool features and hardwares so stay tuned!



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January 11th, 2016 | Category: Uncategorized | Comments are closed

(Deutsch) Wahnsinn! Neuer FUMANOID Roboter noch vor BER fertiggestellt!

Sorry, this entry is only available in German.



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November 29th, 2015 | Category: [Uncategorized](#) | [Comments are closed](#)

(Deutsch) It's been a while

Sorry, this entry is only available in **German**.



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November 10th, 2015 | Category: [Uncategorized](#) | [Comments are closed](#)

Rien ne va plus

Unfortunately the FUManooids missed the semifinals. The good news: We detected the ball and goals from pretty long distances, and getting up again after falling down worked like a charm as well. The walker was pretty stable and this is the first competition we used the "Ready"-phase to have the robots strategically position themselves. Last, but not least, we could walk. Nice.



Self -Positioning

The Chinese ZJU Dancers danced their way to victory, one might say. Their stable and fast walking made them hard to stop on their way to our goal. They took the lead in the first few minutes after Emmy, our designated goalie, decided to turn around and take a walk in her own goal and Grace decided to just stand by and politely let the opponent pass. In the second half Ada took the courage and went into offense, only to be stopped by a Dancer that almost scored a goal in the ensuing counterattack. Emmy blocked the attacker, not giving in to the pressure inflicted upon her, and heroically prevented the 2:0.



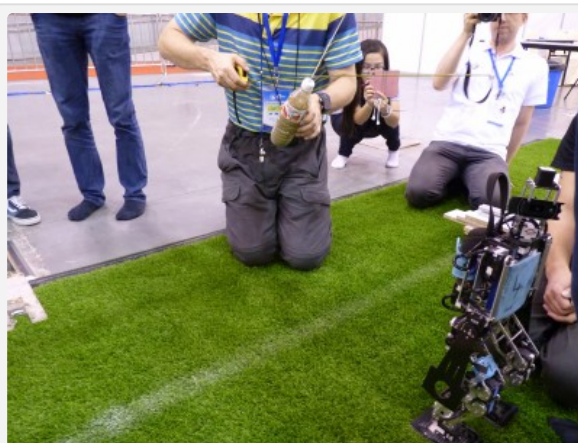
Counterattack by the Dancers

In the end the Dancers deservedly won the match and went on to win the semifinal as well. In the final they will meet the CI Brains, familiar faces to us. It will probably be an exciting match on the highest level.



Teamphoto with the ZJU Dancers

In the evening we participated in two Technical Challenges:
First, Ada had a bottle of sand thrown at her chest and managed quite well to not fall down, the poor thing.



Throwing sand at Ada

Later, we tried to kick a fast moving ball into the goal, which unfortunately failed whenever the ref looked. But hey, we got prove it worked at least once:



Technical Challenge (GIF-Animation)

More pictures in the next few days!



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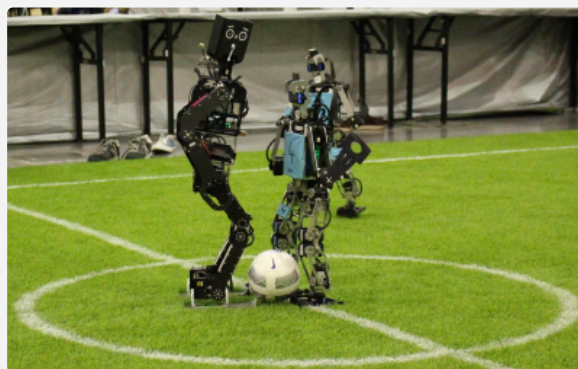
July 21st, 2015 | Category: [RoboCup 2015 China](#) | Comments are closed

We Reached the Quarterfinals!

Short summary of our game day. It was long and very exciting!

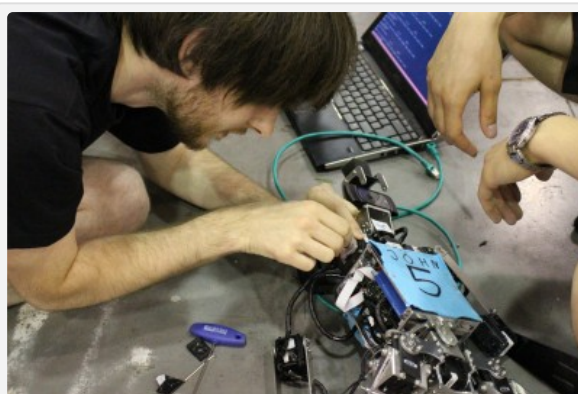
First game against the Wolves: 2:0 Win, Ada scored twice and showed us how the robot walk is done!

We made it to the second round robin phase!



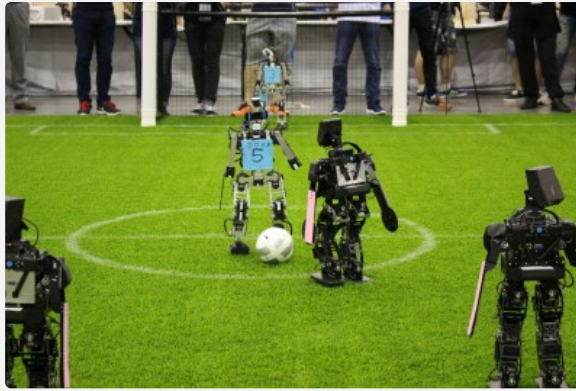
Faceoff with the Wolves!

Second game with the CIT Brains (Japan): These guys are the most promising team of the competition. But we held our ground pretty well! Because both teams had little problems finding the ball and running towards it, there were lots of collisions and damage done (we had two broken arms that needed tending to..).



Surgery urgently needed! Anyone got a spare arm lying around?

In the end the Brains were able to transform their sweet shooting skills and fast walking speed into two goals.



Duel with the CIT Brains

Third game, KUDOS (South Korea): In this game neither the vision nor the walking worked as well as in the other two games. Not much happened, in the end Ada saved the day again by scoring in the last few seconds.



KUDOS goalie looking at the playing field

So now we are second in our group and will meet the ZJUDancers (China) again in the quarterfinals tomorrow.



All sizes group shot of the Humanoid League



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First Gameday, First Goal!

While our first game against the RoboFEI-HT was a tie, our first goal took place in the second!



Calibrating before the game

First Game against RoboFEI-HT (Brazil): After not a lot to look at and just one run towards the opponent's goal by Ada that ended much too soon on the penalty box line, the game ended with a score of 0:0.



Game with RoboFEI-HT

In the second game John managed to dribble the ball over the score line and thereby scored our first goal!



John Dribbling Towards the Goal (GIF-Animation)

Later the strong dribblers of the Dancers were able to score a goal and evened out the score. The ZJUDancers are one of the tournament's strongest teams, so the tie is quite the success for us.



Servicing the Robot

Tomorrow we will play our last game of the first round robin phase, and there is a lot left to work on and little time to do so. So it stays interesting.



Calibrating the Goal Post

PS: Only four out of 15 teams in the league have scored a goal today! (see [the results](#))



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