

The Interplay of Aldebaran and RoboCup

Interview with Rodolphe Gelin, Executive Vice President-Chief Scientific Officer, Aldebaran Robotics

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Published online: 25 July 2016
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Rodolphe Gelin (1965) started his career at CEA (French Atomic Energy Commission), he has been working there for 10 years on mobile robots control for industrial applications and on rehabilitation robotics. Then he had been in charge of different teams working on robotics, virtual reality and cognitics.

In 2009, he joined SoftBank Robotics as head of collaborative projects. He is the leader of the French project ROMEO that aims to develop a human size humanoid robot. Since 2016, he is Chief Scientist Officer at SoftBank Robotics.

KI: Mr. Gelin, the cooperation of Aldebaran Robotics and RoboCup seems to be quite beneficial for both sides. How important as a testbed and marketing platform was the RoboCup for the success of the humanoid robot Nao?

The RoboCupers were our first customers. In 2006, when the Robocup organizers were looking for a platform

for the standard platform league (former four-legged league), Nao was just a fragile prototype but convincing enough to be selected. Then it had been the rush to deliver the Nao teams to the seven competitors of the standard platform league. With the RoboCupers we discovered the way “non Aldebaran” people were using intensively our robots. This population of users was representative of what became our main market for Nao: research and education. Our engineers spent a lot of time with the RoboCupers to assist them in programming (and fixing) the robots. Two major features of Nao are directly coming from the RoboCup experience: the bottom camera that was added for the detection of close balls and the stand up procedure. The RoboCupers imagined a very fast, efficient and elegant way for Nao to recover after a fall. For a long time, it has been the official stand up behavior of Nao. The very good visibility of the RoboCup in the academic community gave definitively a strong marketing advantage to Nao.

KI: What do you think in terms of research and education is the unique selling point of RoboCup from the perspective of a successful robotics company?

The robotic industry will need more engineers, more developers, more trained people in the future. For the students, the RoboCup is an exciting challenge to discover everything that makes the beauty of the robotics: the “perception, decision and action” loop. A good RoboCup developer is, for sure, a good candidate to work in a robotic company.

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KI: If you would be able to create a RoboCup league of your dreams, how would this league look like?

I dream of robots able to play on a real soccer field. It would mean that our robots are able to be fast enough, reliable enough, stable enough with a long operating life. I still have in mind the objective that in 2050 the best team of robots will defeat the best human soccer team. It is interesting to consider that, with the singularity expected in 2045, the robot will be first more clever than the human being and, only five year later, a better soccer player.

KI: What is the essence of RoboCup for you as a company?

Every year, our engineers and technicians are very excited to attend the RoboCup to help the RoboCupers, to see what the progress of our robots. It is an exhausting period for them but they love it because they see what they generally never see: people working with the robots they have designed. For the company, the RoboCup is a wonderful event to make our robots always more popular. The soccer game is so important in our culture that demonstrating humanoid robots playing this game shows how easily they can be close to us.

The soccer game is a very challenging application for our little humanoid robot but unfortunately (I regret to say it), it is a niche market. It is like Formula 1 for a car manufacturer. It is more a fascinating laboratory than a real market. For a company like SoftBank robotics, the big market of humanoid robots will come with other use cases like assistance to elderly person or domestic companion. Our new robot, Pepper is probably more adapted to this market. Pepper is 1.20 m high, moves on wheels and has a 12 h autonomy. It can be used safely at home, all day long, providing the good service at the good moment. That is the reason why we are very interested by the RoboCup@Home competition. This competitors are trying to solve very concrete problems that our robots will have to face in the real world: navigation, obstacle avoidance, grasping, human-robot interaction... We would be very happy if Pepper could become a kind of standard platform for this competition, as Nao became for the soccer competition.

Pepper could benefit of the imagination, the creativity and the innovation of many researchers. It would be a wonderful accelerator to reach the customer market and to propose the humanoid robot that everybody expects: a nice and efficient companion at home.

The problems that the robot has to tackle for a domestic application are based on the uncertainty of the environment. On a soccer field, the shape of the field is known, the size of the ball is calibrated, the lighting is good. The obstacles the robot has to avoid are other robots. I would not say it makes things easy and all the RoboCupers of the Standard league would not appreciate I say so. But this calibrated environment make (some) things easier. In a domestic environment, a same object (a chair) can have different shapes and colors, the lighting conditions are often unregulated. Our comfortable domestic environment is, actually, quite hostile for our poor robot. And probably the most incomprehensible part of the domestic environment for the robot is the human being herself. Because of the humanoid shape of our robots, the user expects to interact with it in the same way it interacts with human being: by voice, by gesture, referring to a lot of cultural and semantic background that is, basically, not known by the robot. Interacting with the environment is a classical robotic challenge; interacting with human beings is the new challenge of companion robots. This could be a new challenge for the RoboCupers.

KI: It is said that participants gain special experience through RoboCup. Have you hired from the RoboCup community and what are your experiences with these talented young people?

One of our colleagues, working on the walking algorithm, is a formal RoboCuper. He knows very well the qualities and the limitations of our robots and is capable of getting the best from them. In some labs, we are collaborating with, we regularly meet researchers that were (or still are) RoboCupers. Knowing our robots very well, they are perfect to transfer the knowledge from their lab to our products.