



MARS ROVERS IN MOTION TO MAKING DISCOVERIES ON THE RED PLANET

The University Rover Challenge is a premier robotics competition organized annually by Mars Society US during summer at Mars Desert Research Station (MDRS) in Utah, USA. The challenge is to build a next-generation Mars Rover capable of working alongside humans in future Martian colonies. Each edition of the competition has a problem statement. The problem statement defines their mission to capture the complex system design requirements in such a scenario. REGNER[®], with their reliable electronic linear actuators, is one of the technology providers to set the Mars rovers in motion.

Prepared for the uncharted

The University Rover Challenge (URC) is the world's premier robotics competition for college students. Held annually in the desert of southern Utah, URC challenges student teams to design and build the next generation of Mars rovers that will work alongside astronauts exploring the Red Planet one day.

A Mars rover is an automated motor vehicle that propels itself across the surface of the planet Mars upon arrival. Rovers have several advantages over stationary landers: they examine more territory, and they can be exposed to extreme elements, they can be placed in sunny conditions to harsh wintery months, and they can advance the knowledge of how to perform very remote robotic vehicle control.

A rover, a vehicle used to explore new terrain, must be prepared for the uncharted. This is the challenge that Shantam Shorewala, as the leader of the Mars Rover Manipal team, has to overcome. This engaging project requires abilities and know-how in science and engineering.

Achieving excellence by staying true to the motto "Design to discover"

Mars Rover Manipal came into existence in September 2014. It was the creation of three budding engineers who wanted to research the robotic solutions to exploring Mars. The team started working in October 2014 at Mars Rover Manipal workshop located in Manipal, Karnataka.

The first team had just 9 team members. Now the team strength has increased to 25 students spread across 5 sub-systems: Mechanical, Artificial Intelligence, Electronics, Management and Science Cache. It has established itself as Asia's best rover team.

Mars Rover Manipal strives to achieve excellence while staying true to their motto 'Design to Discover'. They target the competition as a platform for them to hone their overall engineering skills in design and deployment of an Intelligent Rover System.



Inspiring and empowering others to do their best

Shantam Shorewala is a third-year Engineer major. He has managed to juggle both school and this demanding project.

How did you get involved in the field of robotics? Has it always been one that interested you?

The field of robotics has always been of great interest to me. However, it really took off when I was recruited into Mars Rover Manipal. The team gave me real exposure to it and an opportunity to work in this interdisciplinary science for the first time.

You have been working on the Mars Rover Project while completing your course requirements. How do you manage?

The workload can be quite stressful in the beginning but with time it becomes more of a habit. It still is taxing, attending lectures all day and then working in our workshop till late in the night every day but the passion and commitment to our work ensure it is not an obstacle.

Moreover, I do believe there are shortcuts to happiness. Delivering well-done engineering is for me one of those shortcuts.

What does a typical meeting of your MIT team look like?

We have a weekly team meeting which its importance is often understated. It has compulsory attendance for all the members. It lasts at least 2 hours and can go up to several hours when matters of extreme importance need to be resolved. All groups of the team are expected to share their progress and targets which is very crucial to the system integration of all the components.

Your school competed in 2017 finishing in eighth place, what factors does your team focus on to enhance the rover?

The 2017 edition was a steep learning curve for the team. We made significant improvement from last year, going to the 8th spot from the 13th spot out of an initial 82 teams from around the world. We have identified the key areas we need to address in the new rover and the tasks we need to improve our performance. We are confident we will be able to build upon our previous performance to achieve even better results at URC 2018.

How has AI made a change in the efficiency of the Mars Rover? What role has AI got in the Mars Rover?

AI is a really up-and-coming field and we feel it will make a crucial difference in terms of the performance of the rover especially in automating various aspects of the rover. Currently, we are focused on implementing AI techniques in our computer vision system.

As a team leader, what is your contribution?

As a team leader, I am involved in building a sense of team spirit among mates from different disciplines and skill sets. I always try to reinforce cooperation by listening and learning.

I encourage teamwork because it provides a sense of belonging, a sense of responsibility and ultimately a sense of pride.

What are the most satisfying tasks for you in this project?

It is really difficult to single out one task over others. The most satisfying moment, however, has to be seeing the rover operate for the first time after months of hard work.

Has this project changed you in any way? If so how?

It has taught me time management as well as help me develop a lot of technical and soft skills. Working with and managing such a large group has proved to be a learning experience – it made me realize that the importance of teamwork, which is a big part of our values. I have been a member of the team for upwards of two years now and every moment has been worth it.

Finally, have you had any of your own personal robot projects?

Almost all our team members are involved in different projects of their own. I have worked with many of my teammates to build robots for competitions like RoboWars and Innovation Challenges on a relatively smaller scale.

While there are still many obstacles to overcome before the first manned flight can depart for Mars, Shantam Shorewala and his team have begun to pave the way.

